PETROLEUM WEEK

OCTOBER 21, 1955

■ A McGRAW-HILL PUBLICATION

West Coast Heavy Crude 'Gets Well' 9

Why Does a Gas Firm Buy a Refinery? 11

Oil Demand, Too

New Car Sales May Keep on Rising 13

Utah Find Enlivens Paradox Basin 14

Merger Opens Door to Bigger Deals 18

Iran News Prompts Cheers, Caution 20

Watch for Trends

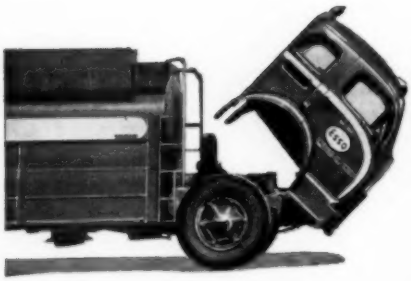
Big Changes Loom for Engines, Fuels 22

Trans-Canada Pipeline Plans Advance 24

East Coast Gets Polyethylene Plant 30

More Emphasis on Creating Markets 32

Price 35 Cents



modern WHITE 3000 REFUELS NEWEST AIRLINERS

. . . *helps cut schedule time*

More work . . . in less time . . . at lower cost – with the WHITE 3000

HERE'S what is new in commercial air travel—the famous turbo-prop Viscount—with amazing savings in schedule time and quiet, vibration-free ride.

And when that familiar Viscount whistle is heard over Dorval Airport at Montreal . . . that's the call for the most modern refueling truck of all—the equally famous White 3000 owned by Imperial Oil Limited.

Throughout the petroleum industry—from first truck into the oil field to consumer delivery, White Trucks have won an amazing reputation for modern transportation service.

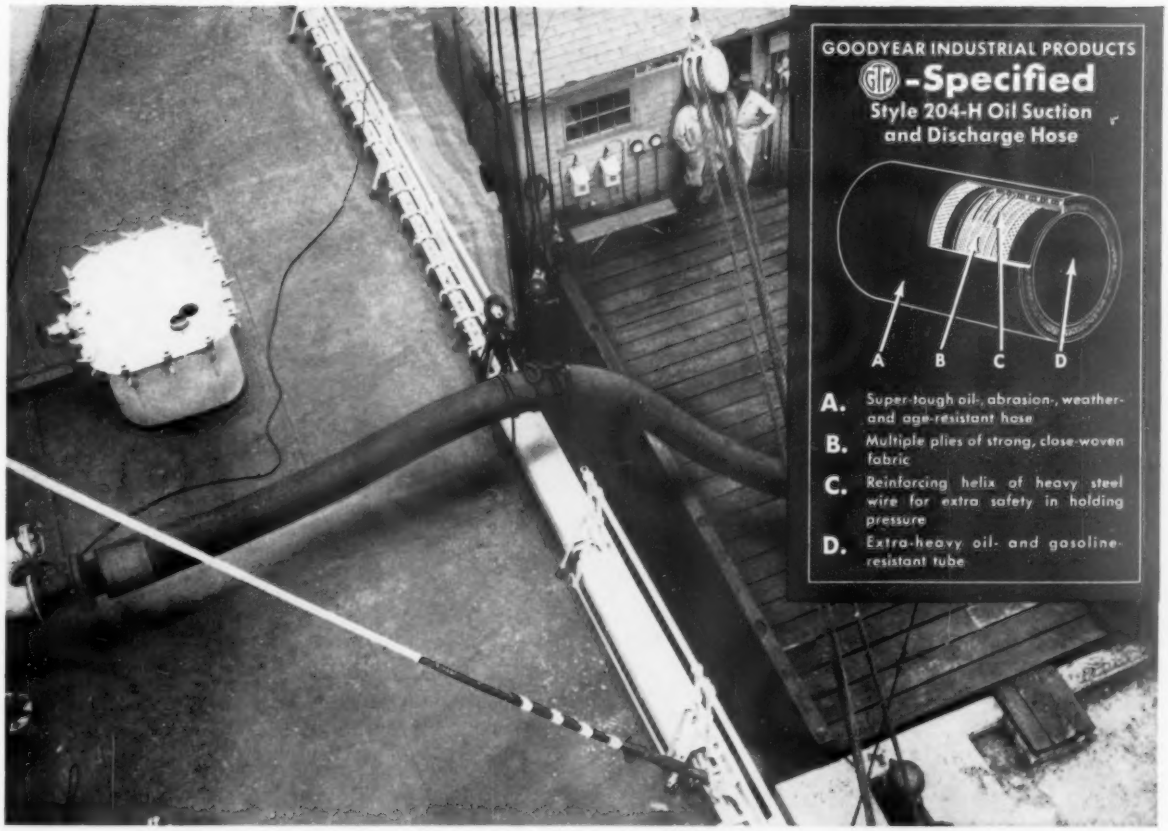
For your own very specialized truck requirements, call your White Representative—he can show you how Whites can effect real savings, first day in service, and for years.

- **Functional Design** tailored to your exact delivery needs. Saves driver steps and time.
- **Power-lift Cab** reduces maintenance costs. Complete front-end accessibility in seconds.
- **More Payload Space** with no increase in over-all length.
- **Greater Maneuverability** because of shorter wheelbase, wider tread front axle, shorter turning radius.
- **Comfortable Easy Riding** combined with maximum visibility and safety features.

FOR MORE THAN 50 YEARS
THE GREATEST NAME IN TRUCKS

THE WHITE MOTOR COMPANY • CLEVELAND

THE WHITE MOTOR COMPANY OF CANADA LIMITED • TORONTO


GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
Style 204-H Oil Suction and Discharge Hose
A
B
C
D
A. Super-tough oil-, abrasion-, weather- and age-resistant hose
B. Multiple plies of strong, close-woven fabric
C. Reinforcing helix of heavy steel wire for extra safety in holding pressure
D. Extra-heavy oil- and gasoline-resistant tube

Hurricane Veteran

gets well-earned rest

THIS IS the story of the hose that fought a hurricane and won, then continued to do yeoman duty for years. The battle took place on November 29, 1944. A 60-mile gale blew into Portland, Maine, sending most of the ships in the harbor scurrying to safety. But one seagoing oil tanker was caught half-unloaded–she couldn't move. Her stern lines held but her other hawsers snapped. She started to swing towards a crash on the beach.

But suddenly her drift was checked by the Goodyear Style 204-H Oil Suction and Discharge Hose recommended by the G.T.M. – Goodyear Technical Man – that was carrying oil from the forward tank. It became taut. Stopped the swing. Saved the ship. It held fast for hours until tugs could buck the blow and remoor the tanker. And in this installation the hose went on to serve for 10 years–far above average for other hose at the dock.

You can get expert help with *all* your hose problems from the G.T.M. Call him today through your local Goodyear Distributor or write Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the Yellow Pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

OIL SUCTION AND DISCHARGE HOSE by

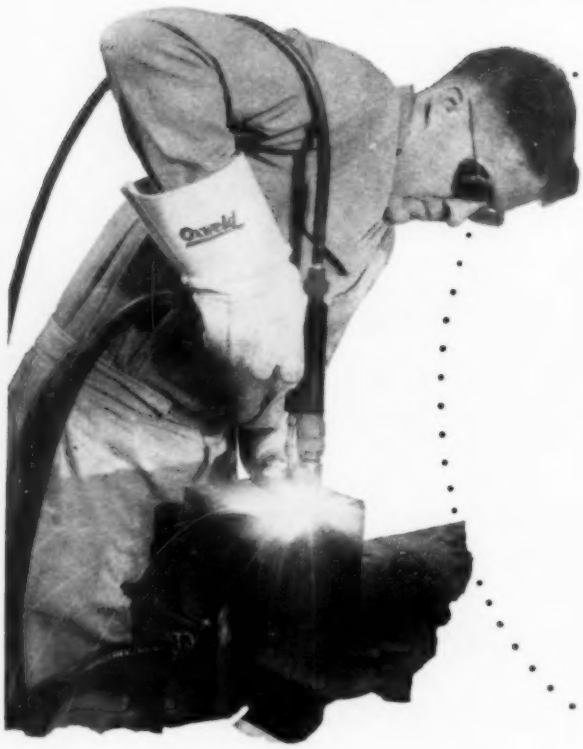
GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD" – every Sunday – ABC Radio Network – THE GOODYEAR TELEVISION PLAYHOUSE – every other Sunday – NBC TV Network

Spot, Plug, and Tack-Weld

with the new SIGMA SPOT-WELDING *process*



- Joins metals up to ¼-in. thick
- Adds filler metal automatically
- Welds from one side of the joint
- Shields weld area with inert argon gas
- Operates on Constant Potential power supply

Spot, plug, and tack-weld with one torch. With sigma spot-welding you can make strong spot welds quickly on lapping metal sheets up to ⅛-in. thick, plug and tack-welds on metals up to ¼-in. thick—and you need access to only one side of the weld joint. Use it on carbon, galvanized, or stainless steel, and copper-base alloys.

It's easy to use. Position the "muzzle" of the water-cooled torch and squeeze the trigger—the machine does the rest. A consumable wire electrode is fed into the weld area as filler metal. Inert argon gas protects the weld from the air. You can make up to 10 welds a minute, with a completely automatic welding cycle.

Constant Potential adds to efficiency. Sigma spot-welding equipment operates on constant potential power supply to give you the benefit of simplified controls, sure starting, and precise arc voltage. Weld-cratering and wire-sticking are eliminated. Welds are smooth and consistently uniform.

Your local LINDE representative will be pleased to give you booklet F-8778 and more detailed information on the sigma spot-welding process.

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto
(formerly Dominion Oxygen Company)

Linde
Trade-Mark

PETROLEUM WEEK

Publisher—Harry L. Waddell

Editor—Herbert A. Yocom

•

Senior Editors—Glenn Green, Jr. (Houston), W. M. Jablonski, J. P. Mosher, Jr., Robert E. Spann, John Barton, Al Reese

News Editor—James M. Sutherland; Clyde LaMotte, Assistant

Assistant Managing Editor—Richard M. Machol

Assistant Editors—Halsey Peckworth, Georgia Macris, Ade Ponikvar, Leo M. Murray, Arthur Matula; *Chicago*—Leonard Castle, Frank Holman; *Detroit*—Holger Ridder; *Houston*—Marvin Reid; *Los Angeles*—Richard Elwell; *Tulsa*—William P. Sterne

Presentation Director—William A. Caperell, Jr.

Editorial Assistants—Betty Deane Suiter (Chicago), Larry Christiansen, Jr., Eugene L. Bush (Houston)

•

Washington News Bureau—George Bryant, Manager; Glen Bayless; *Oil Specialists*—A. R. Patla, Roy Calvin, Ernest Conine, N. B. Musselman, Dean Reed; *Staff Writers*—A. E. Adams, Jay Flocken, Boyd France, William Gilmour, Sam Justice, D. O. Loomis, Gladys Montgomery, A. L. Moore, E. W. Olcott, Seth Payne, M. A. Reichek, Caroline Robertson, Vincent Smith

Domestic News Bureaus

Atlanta—W. H. Kearns, Frances Ridgway; *Cleveland*—Robert Cochran, William N. Troy; *Los Angeles*—John Shinn; *San Francisco*—Margaret Ralston; *Correspondents*—Albuquerque, Austin, Bakersfield, Bismarck, Cheyenne, Cincinnati, Corpus Christi, Dallas, Denver, Fargo, Great Falls, Honolulu, Jackson, Lake Charles, Memphis, Midland, Minneapolis, New Orleans, Oklahoma City, Philadelphia, Phoenix, Pittsburgh, Portland (Ore.), Sacramento, Salt Lake City, San Diego, Seattle, Shreveport, Spokane, Tulsa

Foreign News Bureaus

Editor—John Wilhelm; *London*—Edward W. S. Hull; *Paris*—John O. Coppock; *Bonn*—Gerald Schroder; *Rio de Janeiro*—Peter Weaver; *Mexico City*—John H. Kearney; *Tokyo*—Dan Kurzman; *Bombay*—Gordon Graham; *Correspondents*—Amsterdam, Beirut, Buenos Aires, Cairo, Caracas, Edmonton, Havana, Istanbul, Johannesburg, Karachi, Lima, Manila, Melbourne, Ottawa, Regina, Rome, Vancouver, Vienna, Winnipeg.

Economics Staff—Dexter M. Keezer, Director; Robert P. Ulin

•

Business Department

Advertising Sales Manager—Ervin E. DeGraff; *Business Manager*—Richard H. Loyer; *Sales Promotion Manager*—Peter S. Carberry; *Advertising Service Manager*—John E. Thompson; *Assistant to the Publisher*—George Reid (Houston)

•

Other McGraw-Hill Petroleum Publications

NATIONAL PETROLEUM NEWS
PETROLEUM PROCESSING
PLATT'S OILGRAM NEWS SERVICE
PLATT'S OILGRAM PRICE SERVICE

Vol. 1, No. 16—PETROLEUM WEEK—October 21, 1955

Published weekly by McGraw-Hill Publishing Co., Inc., James H. McGraw, (1860-1948), Founder.

Executive Editorial, and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office, 871 N. Franklin St., Chicago 10, Ill. Donald C. McGraw, President; Paul Montgomery, Executive Vice President; Joseph A. Gerardi, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising; J. E. Blackburn, Jr., Vice President and Circulation Director.

Subscriptions: Address correspondence to Petroleum Week, Subscription Service, 330 W. 42nd St., New York 36, N. Y. Current single copies, 35¢. Subscription rates, all countries: $3 for one year, $4 for two years, $5 for three years. Orders must indicate company, industry division, and position.

Second class mail privileges authorized at Chicago, Ill. Printed in U. S. A. Copyright 1955 by McGraw-Hill Publishing Co., Inc. All rights reserved.

WHERE OIL WELLS BEGIN . . .

This is a picture of a part of the Oil Department at Republic. Behind long lines of doors to the right and left is a complete staff of experienced oil men, engineers and geologists. Behind *them* is the financial strength and the oil "know-how" of one of the first banks to make Oil Production Loans. Production loans originated here have helped add billions of barrels to the nation's oil and gas reserves — and have made the Republic *"The* Oil Bank" to oil men all over America.

CAPITAL & SURPLUS
$60,000,000

•

LARGEST
IN THE SOUTH

•

MEMBER F. D. I. C.

The Financial Center of the Southwest

REPUBLIC
NATIONAL BANK of Dallas

HOW MANY BARRELS JUST DISAPPEAR INTO THIN AIR?

With Microballoon* spheres produced by Bakelite Company, evaporation loss from cone-roofed tanks can be cut as much as 90 per cent for crude oil, 60 per cent for gasoline.

And they now do the job at ⅓ less cost than formerly, as the result of a recent development by Bakelite Company.

With these new microscopic hollow spheres of BAKELITE Brand Phenolic Resin, only ⅓ the usual amount are needed to get the same vapor-stopping blanket thickness.

They have the same physical and chemical properties as the original BAKELITE Phenolic Resin spheres...are used in the same way . . . are just as harmless to equipment, and just as effective in controlling evaporation.

Learn how they pile saving on saving. Write Dept. LS-155.

*Registered trade-mark of The Standard Oil Co. (Ohio).

BAKELITE
BRAND
RESINS FOR
EVAPORATION CONTROL

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.
In Canada: Bakelite Company, Division of Union Carbide Canada Limited, Belleville, Ontario
The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

60-Second Summary

WHAT'S HAPPENING IN OIL

AT-A-GLANCE PETROLEUM WEEK Copyright

October 21, 1955

dept/INDEX

Production	14
Refining	30
Marketing	32
Transportation	24
Washington	6
Key Prices	34
The Market Trend	35
Statistics	36
Editorial	40
Automotive	22
International	26
Management	18
Oil Men at Work	37

Heavy crude on the West Coast is getting back on its economic feet. A near-balancing of supply and demand has permitted a price hike of up to 10¢ a bbl. for heavier crudes and up to 15¢ a bbl. for heavy fuel oil. . . . p. 9

•

Oil men are turning to creative selling to expand over-all markets, boost demand. Such selling spurs industrywide efforts to promote new or increased uses of oil products, unlike the usual practice of battling for established business. . . . p. 32

•

The Paradox Basin shows promise of paying off now, after years of costly frustration. Latest hit: Gulf Oil Corp.'s discovery in San Juan County, Utah. . . . p. 14

•

Italy's parliament begins debate next month on revision of its old oil law. At stake: how much private enterprise in development of Italy's oil resources. . . . p. 26

•

Look for more natural gas transmission companies to move into refining, marketing, become fully integrated oil companies. Reason: The companies are increasing their output of natural gas liquids and crude oil—and, they figure, if they've got the raw material, why not refine it? . . . p. 11

•

A House antitrust subcommittee plans to question Defense Mobilizer Flemming on his handling of the oil imports problem. Staff aides of Rep. Emanuel Celler (D., N. Y.) are digging into the issue, talking to import restriction proponents and opponents.

•

The East Coast will get its first polyethylene plant. Hercules Powder Co. has announced plans to build the plant in New Jersey, in the midst of the largest concentration of users of polyethylene resin. . . . p. 30

•

What has merger meant to two comparatively small oil companies? A check shows the new company can handle bigger deals, add balance—in reserves and personnel. . . . p. 18

•

Coming changes in automotive engines will affect all channels of the oil industry within the next decade. New fuels will be needed, and demand patterns altered. . . . p. 22

•

Canada's cross-country gas pipeline has taken a new spurt toward realization. The Dominion and Ontario governments have tentatively agreed to build the more-expensive eastern half of the line, easing the way for private development of the rest. . . . p. 24

Looking Ahead in Washington

McGraw-Hill
Washington
Bureau

October 21, 1955

A natural gas pipeline brawl is in the offing over plans of Tennessee Gas Transmission Co. and an affiliate to bring in Canadian Gas. TGT wants Federal Power Commission approval for a line extending from the Minnesota-Manitoba border to Nashville. As outlined, the line would largely bypass big-city, heavy-industry gas markets in Minnesota, Wisconsin, Illinois, and Indiana.

Major pipeline companies already serving these areas see the Tennessee proposal as the first step in a move to invade their markets. Firms like American Natural, Northern Natural, Natural Gas Pipe Line, and Panhandle Eastern have two months in which to oppose the proposal formally by filing as intervenors in the case.

•

The antitrust pot is boiling anew. Rep. Wright Patman's Small Business Committee opens hearings Oct. 31 into the Administration's record on Robinson-Patman Act enforcement. The idea is to show that the GOP-led Federal Trade Commission is using the Supreme Court's "good faith" decision in the Detroit case to excuse cases of price discrimination. The committee is expected to explore FTC's failure to act on dealer complaints of gasoline price discrimination. Sen. Hubert Humphrey's Senate small business subcommittee plans a similar inquiry.

Overriding commissions are under fire, too. A Patman subcommittee wants to know why FTC isn't pushing action against this practice. Critics assert oil companies collect an unfair commission on tires sold by rubber companies directly to gasoline dealers.

•

The oil imports question is hanging fire. Defense Mobilizer Arthur Flemming is ready to throw the question of government restrictions back into the lap of the Cabinet Committee on Fuels Policies. Two late developments underscore Flemming's plight: Sen. Saltonstall, key Massachusetts Republican, urges him to avoid import restrictions; H. J. Porter, Republican national committeeman from Texas, wants him to act against importers—and soon.

•

Democrats are trying to keep the "giveaway" issue alive. But Secretary of the Interior McKay is throwing it back at them in regard to the offshore oil lands. He never loses an opportunity to remind them of the hundreds of millions of dollars pouring into the federal treasury as a result of the Submerged Lands Act of 1953. Democrats now complain the Republicans "gave away" federally financed synthetic-fuel facilities at Louisiana, Mo., and charge they want to do the same with the shale-oil pilot plant at Rifle, Colo.

•

Natural gas is becoming a hot campaign issue for 1956. Opponents of industry-backed legislation to free gas producers from direct federal control are girding for the Senate fight now. Eight "consumer" states are asking the Federal Power Commission to roll back "unreasonable" producer prices.

Industry strategists are making a fresh nose count. They now see 52 senators—a majority—ready to vote for the industry bill. But several of the 52 are "doubtful."

Churning up extra life for your drill collars

THE PERFORMANCE of drill collars is determined, appropriately enough, in a bath of oil or water—in the agitated quench tank where the steel gets its final heat treatment.

Whirling propellers churn the coolant in this patented method of quenching. They keep the liquid moving and cooling the steel, faster and more uniformly than conventional quenching methods. As a result, USS Carilloy Steel, bar after bar, has greater, more uniform tensile strength . . . greater, more uniform toughness . . . greater, more uniform resistance to impact and abuse . . . easier, more uniform machinability. In drill collars, it works better for you, lasts longer, and costs less per foot of hole.

It makes sense to specify USS Carilloy when you buy alloy steel parts or equipment for oil field use, or when you make them yourself. Carilloy Steels come in many grades specifically suited to your requirements.

Write or call United States Steel for help with any steel problem—Room 4967, 525 William Penn Place, Pittsburgh 30, Pa. Or call our nearest district sales office.

"T" PROGRESS REPORT: PRESSURE VESSELS

The ASME Boiler and Pressure Vessel Committee has announced a special ruling, Case 1204, permitting the limited use of USS "T-1" Steel in unfired pressure vessels. For reprints of Case 1204 and its significance to welded pressure vessel construction write to: Mr. R. C. Myers, Market Development Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Carilloy Steels

USS

ELECTRIC FURNACE OR OPEN HEARTH
COMPLETE PRODUCTION FACILITIES IN CHICAGO OR PITTSBURGH

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL

Concentrated to break the paraffin strangle hold!

DOWELL PARAFFIN SOLVENT

When paraffin is strangling your oil production, you need the best solvent . . . the one you can *depend* on to remove paraffin fast.

The proven, time-tested way to get rid of paraffin is with Dowell Paraffin Solvent. Thousands of experienced operators rely on Dowell Paraffin Solvent to restore production efficiency by cleaning tubing, rods, lead lines, tanks, screens, liners, perforations and the faces of formations. Dowell Paraffin Solvent is concentrated. It's specifically designed to dissolve both pure paraffin, and also deposits containing asphalt, sulphur and other foreign elements. As a result, it dissolves more paraffin at lower cost to you.

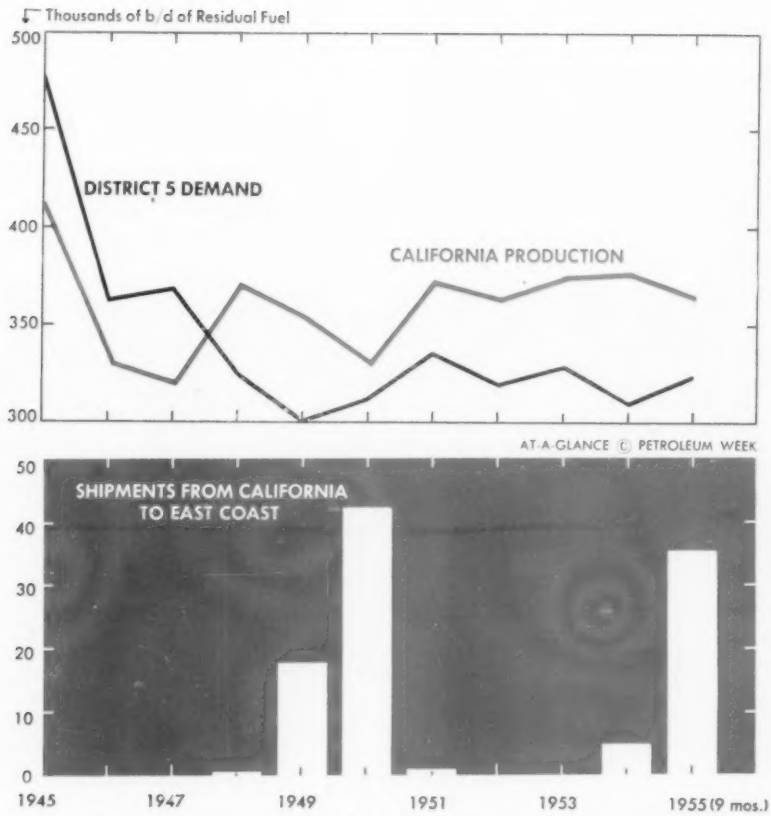
Available at both supply stores and your local Dowell station, Dowell Paraffin Solvent is easy to buy. It is packaged in 10-gallon steel drums with a spout for easy pouring.

Dowell's experienced engineers can give you expert recommendations for effective, fast solutions to your paraffin problems. Ask for the authoritative Dowell handbook on the proper use of paraffin solvents.

For more information, call any of the 165 Dowell offices in the United States and Canada; in Venezuela, contact United Oilwell Service. Or write Dowell Incorporated, Tulsa 1, Oklahoma, Department J-75.

services for the oil industry DOWELL

A SERVICE SUBSIDIARY OF THE DOW CHEMICAL COMPANY



RESIDUAL OVERSUPPLY has long plagued California, which is too far from East Coast markets. But now a better supply-demand balance has resulted in . . .

Good News for Heavy Oil

An increase in the price of California heavy crude this week marked the progress of the West Coast toward solution of one of its toughest problems—the long-standing oversupply of heavy crude and residual.

The price hike for crude of 25-gravity and below, initiated by California Standard, ranged from 1¢ to 10¢ a bbl., with the higher increases going to the heavier crudes.

The price upswing was made possible by a near-balancing of supply and demand. Two factors have contributed to this: (1) a gradual reduction in the ratio of residual output in relation to lighter products; and (2) the stabilizing of residual demand.

The new strength in the market has enabled producers to restore an estimated 12,000 b/d to 18,000 b/d which had been cut back last year in an effort to ease the strain on the heavy crude oversupply. Furthermore, residual surpluses have dropped from a topheavy 29.5-million bbl. at the end of 1954 to a comfortable 15-million bbl. now.

The most cheering factor of all is the indication that the current improvement is a stable, long-range one, rather than simply being another cycle in the up-and-down situation which has long plagued this segment of the industry.

The heavy crude market on the West Coast has been sick most of the time in the past 10 years, except for the Korean War period. Normally it hasn't had much outlet for residual which couldn't be absorbed in its own region. In some years, such as this one, considerable amounts have been shipped to the East Coast (chart). But that can happen only when the East Coast price is high enough to make the long haul economical.

The oversupply situation which has plagued the West Coast in recent years was brought about partially by the dieselization of the railroads. In the East, the advent of diesels was cheered because it enabled oil to move into a market which had belonged almost exclusively to coal. In the West, however, where there was no coal, diesel cut mercilessly into residual sales to the railroads.

There was also a heavy blow to residual from another source—natural gas. This began in 1947, and the flow from Texas and New Mexico has zoomed since then. By 1955, there was pipeline capacity of 1.4-billion cu. ft. daily into California.

These factors, together with the fact that California-produced crude is heavier than average to begin with, made the outlook increasingly dark. Then some new developments began turning the tide.

Improved refining techniques are helping to get at the root of the problem: how to reduce the supply of residual. Up to their advent, each time a refiner stepped up his output of lighter products, it resulted in an increase in his output of residual. Now, however, refiners are able to get a higher percentage of light products from a barrel of crude.

The effect of these improvements is shown in a statement filed with the Federal Power Commission by the Oil Producers Agency of California. It points out that California's residual fuel oil yields dropped from an average of 38.1% of refinery runs in July, 1948, to 30.7% in July, 1955. Based on runs of 1-million b/d, this is a cut of 74,000 b/d in fuel oil output.

Increasing use of coking facilities are also having a considerable impact. The agency estimated that cokers presently planned will consume another 50,000 b/d of residual as soon as they go into operation. That means less residual to move into the market.

There are other, lesser, factors which are helping steady the over-all supply-demand situation. One of these is that California production apparently isn't going to be able to keep up with demand. This will cause an increase in imports of products or crude.

If products are imported, they cer-

tainly will not include residual. And if crude is imported, it will be lighter than the California crude and will therefore yield less residual.

There is progress, too, at the other end of the problem: improving the demand for residual. California oil economists feel that the losses of residual markets have just about stopped, and that new market possibilities are in the offing.

The dieselization of railroads is almost complete, so there will be little further market loss in this field. Bunkering is expected to continue at its present level. Losses to natural gas will be offset—at least in part—by the over-all growth in energy requirements in the West.

The brightest prospect for increased demand lies in electric utilities. The West Coast, which long has been blessed with low-cost hydroelectricity, is being forced to depend more and more on power produced from steam plants. Residual has to share this market with natural gas, which steam plants use in gas-surplus months, but it still is a sturdy market—presently about 45,000 b/d in the five western states, and still on its way up.

Optimism for the outlook for heavy crude is tempered by some caution. Economists warn, for example, that the demand for residual this year is running at a higher rate than it is likely to maintain.

The Oil Producers Agency estimates this year's demand will average around 422,000 b/d, whereas the economists figure the "stable" level is more apt to be about 350,000 b/d. At that figure, they say, demand and supply are more likely to balance comfortably over the long haul.

The economists contend, too, that residual is the most sensitive to general economic trends of any petroleum product. That is, when general business varies, residual demand fluctuates with it. This is due largely to the fact that industry is one of the biggest users of residual.

West Coast oil economists are also careful to point out that the improved outlook for residual should not cause a refiner to decide against plant improvements which would enable him to decrease his residual output. For, if the residual market should contract again, the refiner would be right back in the same spot he was in before the condition of heavy crude and residual took a turn for the better this year.

Meanwhile, the strengthening of the crude-residual status is having several good effects in California. It has made possible a slight increase in production; it has enabled refiners to turn out a maximum flow of products without being swamped by residual, and it has eased the strain resulting from carrying too-heavy stocks of residual.

This week's price hike in heavy crude was a direct result of the combined impact of these good effects. The Oil Producers Agency, which represents about half the independent producers in the state, had been asking point blank if a rise in price was not due. Stark Fox, executive vice-president, had pointed out that heavy crude prices were 10% lower than they were in 1948. He pointed out further that production costs had risen during that time.

Heavy crude producers are accustomed to sharing the fortunes of residual. The price of their crude was $2.18 in 1947. When residual suffered a sharp oversupply and a resultant price cut in 1949, heavy crude prices slid down, too—to a low of $1.28. It pulled back up to $1.98, but producers felt they still weren't getting their full share of the good fortune which has fallen to residual. This week's rise, therefore, was roundly cheered.

Bored with Canasta? Try This Game

Scientists will be scientists even when it comes to "playing games." The latest form of relaxation at the products research division of Esso Research & Engineering Co. is a mathematical "game" to solve a synthetic research problem.

The problem: How to boost the current 22% yield of a model alcohol plant to a maximum figure with a minimum number of experimental runs.

Don McArthur (left, above), head of the Jersey Standard committee on mathematical techniques, devised the game to stimulate interest in the application of mathematics to the scientific approach to research.

The game board is a model, or analog, of the alcohol plant. It is an electrical device with five dials, each representing an operational variable.

The number of contestants is unlimited, but as of last week 15 teams of three players have been changing the dials to various settings in successive "plays" toward the target of maximum products yield.

The "jokers" total up to 1,001 and they can be used only by the scorekeeper and game-master McArthur. He uses them only when it throws the players into utter confusion. The first joker is in the model. One of the five dials is a phony. Secondly, when a team gets near a possible answer, McArthur pulls a hot deck from his sleeve consisting of 1,000 cards, each representing an unexpected variable.

The score is worked out in dollars, in this case real ones, not play money. The dollar score is evolved from values attached to the percentage of improved yields: $50,000 annually for each 1% during the estimated 10 years of the plant's life.

Contestants, however, have to "put up" $20,000 for each "play," since that's what the experimental run would cost.

El Paso, TGT lead pipeliners' move . . .

From Gas to Refineries

Another big gas transmission company is diversifying and becoming a fully integrated oil company. The latest to make this move is El Paso Natural Gas Co., and it may be indicative of a trend that can be expected of other gas producing and transmission firms in the future.

The big step in El Paso Natural's diversification is the purchase of McNutt Oil & Refining Co., which was being completed this week. McNutt owns a 4,000 b/d refinery at Brickland, N. M., and is a branded marketer of petroleum products through 125 retail outlets in West Texas, New Mexico, and Arizona.

El Paso is already considering plans for expansion of the refinery, which has about 1,100 b/d of cracking capacity, though the company is keeping quiet as to the details. Paul Kayser, El Paso president, will say only that the company plans to keep pace with the rapid growth in the Southwest and West—the areas served by El Paso's pipeline network.

Previously, Tennessee Gas Transmission Co. made a similar integration step by the purchase of most of the assets of Bay Petroleum Corp. (PW—Jul.22'55,p19). Tennessee Gas has also formed a jointly owned subsidiary with Food Machinery & Chemical Corp. to produce butadiene at a formerly government-owned plant at Houston.

Such diversification is a logical step for El Paso Natural. The company has the primary raw materials for making finished petroleum products and petrochemicals, and it's just one more step to turn out these products.

"What we plan to do," says Kayser, "is to take the raw material streams we have and upgrade them in our own plant into more salable products." These streams are the crude oil that all gas companies find in their search for natural gas, and the liquid hydrocarbons they remove from wet gas in the fields.

Crude is sold to refiners, and the growing volumes of natural gas liquids —primarily natural gasoline, butane, and propane—go to refineries, to petrochemical plants, and to jobbers who, in turn, sell propane and butane as fuel.

Natural gasoline, the biggest moneymaker of the gas liquids, is used chiefly by refiners in the blending of automotive and aviation gasolines. The highly volatile natural gasoline, however, has been losing its position as a blending material in the octane race. And natural gasoline producers have been faced with the problem of installing additional facilities to upgrade the material in the field.

The biggest volume from the natural gas stripping plants consists of butane and propane. While these have hundreds of uses, there is a big seasonal factor in demand. This, plus the growing availability, results in surpluses in the summer and, consequently depressed prices.

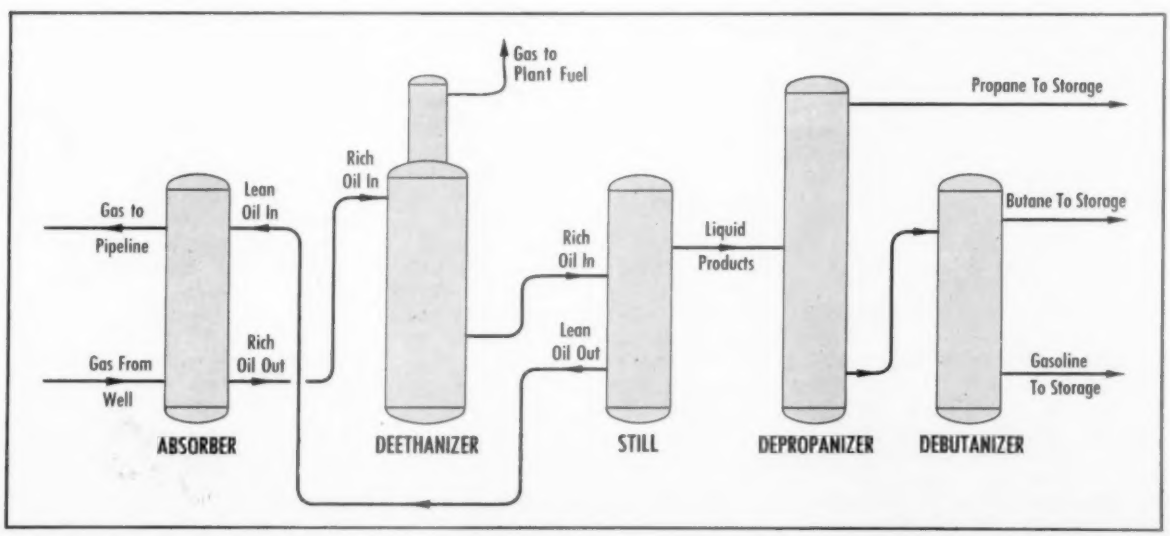
The diversification move stems, in part at least, from the extension of Federal Power Commission authority to regulate producers and gatherers of gas.

The many independent producers—large and small—provide the major part of the gas that goes into the big transmission systems. The gas pipeline companies view the extension of FPC authority as a distinct threat to their long-range gas supplies, since producers are reluctant to explore for gas that will be price-regulated by FPC.

With the prospect of getting less gas from independent producers, pipeline companies figure they'll have to produce more gas themselves to insure adequate supplies for their systems.

Most of the companies have conducted limited exploratory programs. But they are now giving increased emphasis to the search for gas. "The increasing demand of the customers can best be met . . . by an aggressive campaign of exploration by the company to develop at least a substantial part of the natural gas reserves required to meet such demand," according to El Paso president, Paul Kayser. This view is shared by other pipeline companies as well as by FPC.

As the transmission companies increase their search for gas, they're bound to find crude oil in growing volumes. And with larger gas production—and particularly greater use of residue gas, or casinghead gas produced from oil wells—more and more gas liquids will be stripped and become available to the pipeline companies. Which means more and more of them are likely to expand their refining activities.



MORE NATURAL GASOLINE from field processing plants (above) is one reason why gas transmission firms are diversifying.

What's New / IN THE INDUSTRY

To Store LPG in Chalk

An underground storage project is being mined in a chalk formation in Alabama by Tuloma Gas Products Co. and Sinclair Oil & Refining Co. It will have a capacity of 8½-million gal. of liquefied petroleum gas.

The storage project is near Demopolis, Ala., about 60 mi. southwest of Tuscaloosa. It is expected to be ready for storage by May, 1956.

The main shaft will be drilled 300 ft. and set with 42-in. casing. At 300 ft., storage tunnels will be mined laterally from the bottom depth throughout the surrounding area. Some 50,000 cu. yd. of chalk will be removed.

Company officials say they believe this is the first underground storage cavity mined in chalk. There are, however, about 170 LPG underground storage facilities in use, with a total capacity of more than 670-million gal. Most of these cavities are in salt beds and salt domes.

The principal advantage of the Alabama location is that deliveries can be made direct from it to consuming areas to meet peak winter demand without the necessity of long transit shipments from producing areas in the Southwest or Mid-Continent.

•

New Gas Substitute?

Possibility of developing a substitute natural gas from oil or coal, perhaps by using nuclear reactor energy for process heat, was discussed at the American Gas Assn. convention in Los Angeles this week.

F. D. Campbell, chairman of the association's atomic energy committee, said the Bureau of Mines is experimenting with a synthesis process involving a nuclear reactor. He said he understood the process eliminates the oxygen plant which consumes 70% of the energy required in present synthesis process, and that it results in a gas having a heat content nearly equal to the input of coal. The present synthesis processes have only a 45% efficiency.

Campbell, president of the New England Gas & Electric Assn., said his people feel that production of a natural gas substitute is going to be extremely important to the protection of gas supplies in New England. Such a step would help allay fears of financial interests as to the future economic position of the gas industry when—and if—natural gas is no longer available.

•

80 Acres Wins

The North Dakota Industrial Commission has set 80 acres as the proper well spacing for two pools in northwestern North Dakota. This may be a precedent for a ruling to be made soon on the state's two largest fields—Beaver Lodge and Tioga.

The 80-acre spacing in the Charlson-Madison and Hofflund-Madison pools was requested by Amerada Petroleum Corp., The Texas Co., and other operators. Landowners' representatives had asked for 40-acre spacing.

The hearing on the Beaver Lodge and Tioga fields, which will begin Oct. 26, involves a similar controversy over whether spacing should be one well for each 40 acres, or one for each 80 acres (PW—Oct.14'55,p20).

•

The Oil, Chemical & Atomic Workers Union (CIO) has signed three-year contracts covering three atomic plants. The union says this will guarantee industrial peace in a major segment of the atomic industry. Negotiations are continuing at three other atomic installations, including the Phillips Chemical Co. operation at Arco, Idaho. The new contracts cover plants at Oak Ridge, Tenn.; Paducah, Ky.; and Jamestown, N. Y.

•

Two oil company executives will represent the industry at a Conference on Equal Job Opportunity in Washington next Tuesday. They are Theodore S. Petersen, president of Standard Oil Co. of California and Eugene Holman, Chairman of Standard Oil Co. (N. J.). Some 65 business and industrial leaders will take part in the conference, sponsored by the President's Committee on Government Contracts. Vice-President Nixon will preside.

•

Cities Service Co. will build a research center at Cranbury, N. J., to study product developments in fuels and lubricants, including the use of nuclear energy and radioactive tracer techniques in petroleum product improvements. In addition to studying the needs of the automotive field, the center will examine lubricant requirements in the automation field. When completed in the fall of 1956, the center will have facilities for 150 scientists and technicians.

•

Southwestern Industrial Electronics Co., of Houston, and Dresser Industries, Inc., of Dallas, have completed negotiations for merger.

SIE is a manufacturer of electronic equipment having particular application to the oil industry. Dresser is a large supplier of oil, gas, and chemical equipment, and technical services. Earlier this year, Dresser has acquired Land-Well Co., a supplier of radioactive well-logging services, and gun and jet perforating services, for oil and gas well drilling.

•

Shell Companies Foundation, Inc., this week initiated a program to encourage science teaching in high schools. The program will underwrite summer seminars at Stanford and Cornell universities for 60 experienced science and mathematics teachers. Earlier, Standard Oil Co. (N. J.) announced a foundation to aid privately supported colleges and universities (PW—Oct.7'55,p13).

•

A 22% expansion in capacity of its copolymer plant near Borger, Tex., is being planned by Phillips Chemical Co., a wholly owned subsidiary of Phillips Petroleum Co. Capacity of the adjacent butadiene plant will also be increased, to provide additional butadiene for use by the copolymer plant in the manufacture of synthetic rubber.

Company officials say increased customer demand for Philprene synthetic rubber has necessitated the expansion. Construction will begin immediately and is expected to be completed during the first quarter of 1957.

•

Petroleum refinery sales in the first half of 1955 exceeded $11-billion and were 6% above the first half of 1954, the Securities & Exchange Commission reported this week. Profits, after taxes, at $1,141,000,000 in the first six months of the year, were up 7% over the $1,063,000,000 of the first half of 1954.

New-Car Sales: A New Norm?

New-car sales for this year are estimated at 7-million —an all-time record by a wide margin. And it's entirely possible that the auto industry will again sell 7-million cars—or even more—next year.

If it does, some long-range estimates of gasoline demand will have to be revised upward. Maybe what happened to gasoline sales this year isn't just an unusual spurt, produced by an unusually large number of new car registrations. Detroit is figuring on doing this every year.

That's the picture you get from the first round of 1956 predictions out of the motor capital. And economists who questioned Detroit optimism in 1955 are cautious about expressing their doubts this time. After all, the 1955 sales record is the kind of proof that's hard to argue with.

* * * *

What Detroit is saying is that there's been a complete shift in U.S. demand for automobiles—a shift upward. This isn't just a matter of styling, or of people feeling flush with high wages this year. It's a more basic change—one that reflects permanently higher income levels for many people.

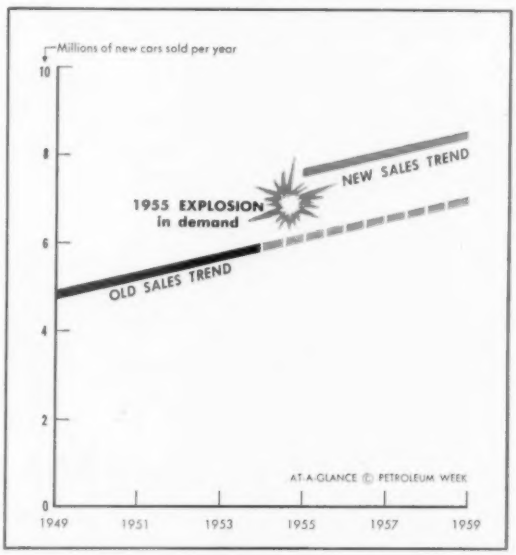
It's now estimated that an average of 1.4-million families each year will cross into the $4,000-plus income bracket during the ten years 1955-1965. The $4,000-plus income group is now big enough, auto men say, to purchase 7-million to 8-million new cars each year, instead of the 5-million to 6-million that might have been expected at the old income levels.

Of course, that doesn't mean they'll buy the same number of cars every year. Style changes will continue to have effects. And so will the way people feel about their personal financial outlook—whether it's getting better or worse. There'll still be recession years like 1954, when people hesitate to buy. But the general trend of auto sales in the future is going to be higher than anything that was forecast a few years ago.

Most economists will go along with this Detroit thinking—up to a point. They agree that higher incomes make a difference. But they're not sure there wasn't something else pretty unusual about 1955. For instance, they say, it's impossible to measure just how much difference the new styles made. So, they caution, maybe we'd better get an average for 1955 and 1956 before we draw a new trend line.

* * * *

There's another very important factor, though: The price cuts made by most dealers on 1955 cars have greatly enlarged the long-run market. Economists point out—and auto men agree—that this is one of the big differences between 1955 and 1953, the last peak year for auto sales. Dealers have turned to the "supermarket" way of selling cars: high volume, on low profit margins.

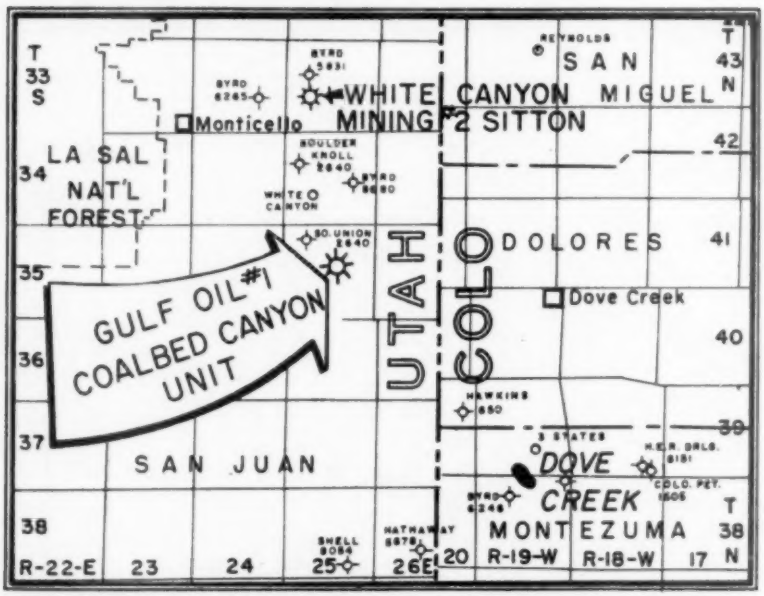


MORE NEW CARS will hit the road each year, as the result of new trends in auto selling. Dealers have found they do better by selling more cars at lower mark-ups. So sales have jumped in 1955, and are likely to continue at a much higher level than in former years.

For the buyer, lower prices are the same as higher income. One of the top business economists, Louis Paradiso, of the U.S. Dept. of Commerce, has figured that every 10% cut in the price of a new automobile means a 13% increase in demand. And anyone can pick up examples of new cars selling for 20% less than comparable makes two years ago. That means a 25% increase in demand, and goes a long way toward explaining why car sales in 1955 are 32% above 1953.

Factory prices of cars haven't dropped 20%, to be sure. But most dealers are discounting 15% from their listed retail prices. And easier credit terms stretch out the payments so that a buyer really puts down 20% less per month, in many cases. As a result, demand has exploded upward (chart).

In 1956 this system may be harder to follow, because dealers are getting squeezed (they have to pay the factory more for '56 models). But "good deals" for the customer are likely to continue. And what may be misery for the dealer is a tonic for the oil business, because price cutting does sell cars.



GULF DISCOVERY in Utah brings new hope of affirmative answer to old question:

Payoff Near in Paradox Basin?

The Paradox Basin is beginning to pay returns on a multimillion-dollar investment.

For five years this rough, remote area that sprawls across southeastern Utah, southwestern Colorado, and northeastern Arizona has been the site of an intensive oil search. But though no secret was made of the quest, it was conducted with little of the customary fanfare. That was reserved, until recently, for the uranium scramble. Now eyes are suddenly turned to oil.

Gulf Oil Corp. is drilling a well to confirm its discovery in San Juan County, Utah, 15 mi. southeast of the town of Monticello.

The Gulf Coalbed Canyon discovery (map) tested nearly 14-million cu. ft. of gas per day from the Paradox (Pennsylvanian), with a distillate recovery of approximately 18 bbl. per million cu. ft. of gas. The test was shut in after a gauge of 10,581,000 cu. ft. of gas with 120 bbl. of distillate and 8 bbl. of water in 26 hours through ¾-in. choke.

This general area was also the scene of an earlier encouragement. White Canyon Mining Co.'s test 8 mi. east of Monticello flowed nearly 2-million cu. ft. of gas per day, also from the Paradox. It has not yet been completed as a commercial producer.

The basin has been the site of numerous disappointments and one near-miss.

As early as 1928 Midwest Oil Corp. had a flowing oil well in Utah's San Juan County. The hole was lost when the rig burned; and an offset was a failure. Other exploration over the years produced shows, but no commercial production. However, the total amount of drilling in the basin prior to 1950 was not enough to do more than point to glittering possibilities.

Shell Oil Co. has the longest recent history of exploration in the basin. After several years of investigation, it drilled in the Bluffs Unit, San Juan County, Utah, and received some encouragement.

Real attention was not drawn to the basin until November, 1954, when Shell scored a Pennsylvanian discovery.

After completing the test for 248 b/d through 14/64-in. choke, Shell moved over and drilled another producer, and a dry hole.

Shell made another basin discovery early this year for a flow of 375 bbl. of oil per day, with 2½-million cu. ft. of gas.

It was also Shell that gave Arizona its first discovery. This test, in Apache County, followed an earlier test that had noncommercial shows.

Humble Oil & Refining Co. also scored an Arizona discovery. A test south of the old Boundary Butte prospect, where small oil and gas production has been known since 1924, flowed 4¼-million cu. ft. of gas per day before being shut in.

The industry's refusal to give up on the basin was evidenced in 1953 lease sales, which netted $7-million for the Navajo and Hopi Indians.

Shell alone invested more than $3-million when the Bureau of Indian Affairs offered lands within the Indian reservation that straddles the Arizona-Utah line. Bonus bids ranged up to $129 per acre as leases were won by Continental, Carter, Skelly, Superior, Stanolind, Sinclair, Kerr-McGee, Gulf, Humble, El Paso Natural Gas, Honolulu Oil, Ohio Oil, and others, both major oil companies and independents.

The total investment in the basin is now tremendous. Federal acreage is solidly leased, and available state and fee lands have been taken.

Estimated expenditures of more than $10-million for land alone are probably conservative. One company has had one or more seismograph crews in the area for more than three years.

One reason for keen interest in the basin is the Pacific Northwest Pipeline, first outlet to promise service to the Paradox Basin.

This carrier, now pushing northward into the Pacific Northwest, will also offer additional outlet to the San Juan Basin of northern New Mexico and southwestern Colorado.

Drilling is quickening in the Paradox area. Carter, Stanolind, Sinclair, Humble, and Gulf are drilling; Ohio and Stanolind are preparing for new activity; and Western Natural Gas Co. and Three States Natural Gas Co., affiliates of El Paso Natural, have turned over a part of their holdings to Reynolds Mining, subsidiary of Reynolds Metals Co., in exchange for a 10-well program in Utah and Colorado this year.

New Barges to Vary Drilling Technique

The promise of a new approach to offshore drilling with a mobile barge came last week from Ingalls Shipbuilding Co., of Pascagoula, Miss. The firm has an order for two $3-million units from Kerr-McGee Oil Industries, Inc., of Oklahoma City.

Until "certain patent problems" are solved by Kermac, information on the new tools is being limited to these details: They will be capable of drill-

ing to 20,000 ft. in 65-75 ft. of water, depending on the weather; and they will be powered by 2,400-hp. diesel electric engines.

The units will have a "radically different approach" in some respects to the problem of deep-water drilling, an Ingalls spokesman says.

He adds that they will offer great improvements over Kermac's Rig 44, which, he says, is "the finest submersible barge now in use." Rig 44 is capable of drilling in 30 ft. of water to 16,000 ft.

A conventional submersible patterned after Kermac's Rig 40, a pioneer in this design, Rig 44 is equipped with two hydraulically positioned pontoons, 140 ft. long, 14 ft. wide, 12 ft. deep.

First indication that the new barges would depart from the submersible design which has been a hallmark of Kermac's offshore operations came earlier from Dean A. McGee, president of the company. After declaring in a prepared talk that "existing models" of the submersible-type barge are definitely not competitive in more than 40 ft. of water, he told PETROLEUM WEEK of plans for the new units capable of working in 70 ft. of water (PW—Oct.7'55,p16).

The Kermac rigs are among 11 of the mobile type now in, or near, the construction stage.

Two which have attracted unusual interest are the Zapata-LeTourneau barge, now nearing completion, and a unit designed for the California Co.

The Zapata-LeTourneau rig will be the first of the tripod-footing design and will be able to operate in water 80 ft. deep. It will have an over-all length of 185 ft. and a width of 149 ft. Each of its three spud pontoons will be 35 ft. in diameter and 32 ft. high. It will have diesel-powered equipment capable of drilling to 15,000 ft.

The California Co. rig, which will cost $6-million and will be capable of drilling in 100 ft. of water, will be the self-contained mobile type, of which C. G. Glasscock Drilling Co.'s "Mr. Gus" was the forerunner. It will have two decks, of which the lower will be placed on the bottom and the upper raised above the water by four 12-ft.-diameter columns. It will drill four wells in a 17-ft.-diameter caisson.

What's New / IN PRODUCTION

Air Cushion for Well Tests

Nitrogen is being used instead of the customary mud or water cushion in testing California wells. This "air-cushion" method permits an uncontaminated test, according to D. F. (Duke) Bloom, of Bakersfield, its inventor.

A new mobile device consists of 30 tubes, each 20 ft. long, containing 42,500 cu. ft. of nitrogen under psi. pressure at 72F. The system is so adapted as to permit use of any combination of tubes in pressuring for a drillstem test.

Since the pressure at the bottom of the hole is governed by the air cushion, the device also permits a controlled test. This allows use of a larger orifice, thereby lowering the chance of plugging the formation tester.

The inventor says the equipment requires only 8 min. to 20 min. to pressure the pipe. Under conventional methods of testing, an hour or two are required to put in a fluid cushion.

The air cushion is said by the inventor to increase efficiency of the packer, due to the pressure being exerted beneath it. In one instance, the packer was made to hold for 50 min. as the air cushion was lifted off the formation, allowing tests to be made in a low-pressure area. The formation might have broken down and the test would have failed in the first few minutes without the services of the air cushion.

The Bloom unit has passed the ICC Bureau of Standards and American Society of Mechanical Engineers safety tests. It has been used successfully in the Rosedale Ranch and Arvin areas.

•

Pipeline Sale Halted

The Kansas Corporation Commission has ordered Sinclair Crude Oil Co. to resume normal purchases from wells connected to two southeastern Kansas pipelines. One line runs from Eureka to Humboldt, the other from Paola to Humboldt.

Sinclair Pipe Line Co. had proposed to sell the lines to Producers Pipe Line Co. of Iola, Kan. The Commission halted the sale; it plans a hearing Nov. 8 at which it will determine if it has jurisdiction over the sale and, if so, whether transfer of the lines is in the public interest.

A group of oil producers in areas of the lines asked that the sale be held up because Producers Pipe Line plans to abandon the Eureka-Humboldt line, forcing the operators to pay higher truck rates to move their oil.

•

Interest in Wells Sold

Producing Properties, Inc., of Dallas, has bought a half interest in 14 East Texas oil wells from F. Wilson Dye and Carl B. King, of Dallas.

Cash consideration was approximately $750,000. The wells are on the J. M. Christian lease, G. W. Hooper Survey, Gregg County, and have a current daily allowable of about 297 bbl.

Producing Properties, Inc., is headed by A. Knox Tyson, former vice-president of American Republics Corp. The firm was organized in 1954 with more than $10-million paid-in capital for the purpose of acquiring producing properties. It has now made five purchases.

•

Ohio Oil Co. has disposed of its Tulsa County water-flood project near Tulsa due to the rapid extension of the city limits. The company, which operated a project only 6 mi. from the Tulsa Post Office, sold the facilities for a reported $100,000 to three Tulsa oil men: Max Bankoff, president of Bankoff Oil Co. and Bankoff Pipe & Supply Co.; Sam Kantor, president, Kantor Oil Co.; and John G. Burris, of Bur-Kan Oil Co.

The sale involves 30 wells and all physical equipment of the flood, in Sections 32 and 33-19n-13e. Five wells are used for water input and 24 are now producing a total of 55 b/d from the Skinner sand, from 825-900 ft. Water comes from an Arbuckle lime well.

•

New Mexico's crude oil production allowable for November has been set at 283,983 b/d, an increase of 6,718 b/d over October permissible production. The State Oil & Gas Conservation Commission pegged production at 40 b/d for each well unit. Purchasers submitted a request for 273,337 b/d and an increase of 11,053 b/d over the October quota during the hearing. One of the primary reasons for the allowable increase with Stanolind Oil Purchasing Co.'s resumption of normal crude purchases.

It had cut back considerably during October as a result of the fire at its parent company's refinery (Standard Oil of Indiana) at Whiting, Ind., but resumed normal purchases last week.

•

Drilling Highlights

Louisiana Offshore—The CATC group has an oil discovery in 97 ft. of water, a record depth for Gulf of Mexico operations. The State 953 Unit No. A-1, Jefferson Parish, has a possible 82 ft. of commercial oil shows and 62 ft. of commercial gas shows in Miocene sands at five intervals, ranging from 9,845 ft. to 15,054 ft. Total depth is 15,058 ft. On drillstem test at 13,614-20 ft. the well flowed at a rate of 405 bbl. of 38.7-gravity oil through 5/32-in. choke in 24 hours.

Completion will be made within the next two weeks from the group's $1.5-million self-contained platform. More than 50,000 acres are held under lease in the immediate area by CATC, composed of Continental Oil Co., the operator, Atlantic Refining Co., Tide Water Associated Oil Co., and Cities Service Oil Co.

Nebraska—Jones, Shelburne & Farmer, of Russell, Kan., have an indicated oil discovery in Hitchcock County, western Nebraska. The wildcat is 100 mi. southeast of the Big Springs gas pool of Deuel County, Neb.; 125 mi. southeast of production in Cheyenne County, Neb.; and 60 mi. north of nearest oil production, in Norton County, Kan. The test is being completed through perforations opposite the Kansas City-Lansing lime series of Pennsylvanian age from 3,881-86 ft.

•

Alabama—Zach Brooks Drilling Co.'s John C. Donovan 1, near Citronelle, Mobile County, has been dually completed. The test (PW—Sep.16'55p14) flowed 448 bbl. of 45.3-gravity oil through ½-in. choke in 24-hour test from the Upper Rodessa. The other pay zone is the Lower Rodessa, which yielded 68 bbl. of 42.1-gravity crude in 24 hours through ½-in. choke. The upper zone was perforated at 10,868-959 ft. and the lower zone at 11,288-414 ft.

West Texas—Delhi Oil Co.'s Andrews County wildcat, an Ellenburger project 11 mi. south of Andrews, has found flowing oil in the Wolfcamp. On drillstem test at 8,427-44 ft., the well surfaced gas in 6 min. and oil in 75 min., after which it flowed an estimated 15 bbl. to 20 bbl. of 41-gravity oil per hour. Operator was drilling ahead below 8,453 ft.

Texas Panhandle—Official potential test has been taken at Woodson Oil Co.'s Morrow sand discovery in Ochiltree County, 1½ mi. southeast of Perryton. The well flowed 330 bbl. of 38-gravity oil in 24 hours through ½-in. choke from perforations at 7,767-80 ft. Total depth was 8,103 ft., plugged back to 7,992 ft. for completion.

California—Sunray Mid-Continent Oil Co. will make the next attempt in the continuing campaign to find production in the Eocene sand at Tejon Ranch, 20 mi. south of Bakersfield. Sunray will drill a basement test, probably to 12,000 ft., 3½ mi. northeast of Tejon production and 1¼ mi. southeast of an 11,963-ft. dry hole drilled last year by General Petroleum Corp. This wildcat was credited with noncommercial shows below the 10,000-ft. level.

Western Canada—Imperial Oil, Ltd., has scored a discovery at southeastern Saskatchewan wildcat. The oiler is 2 mi. northwest and 2 mi. southwest of two earlier Imperial discoveries. Production is from the Mission Canyon member of the Mississippian formation.

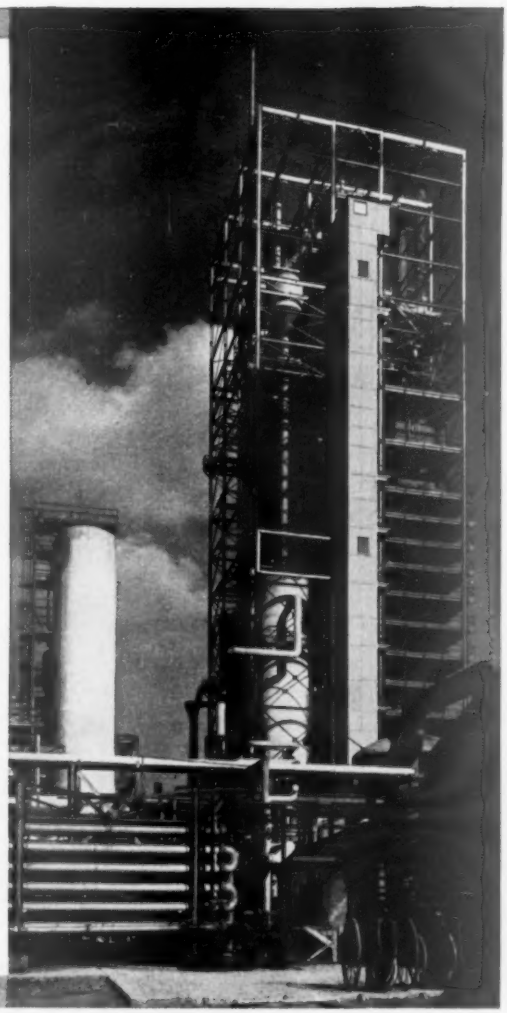
Western Canada—Phillips Petroleum Co. had a flow of 9½-million cu. ft. of dry gas daily on a second drillstem test at its Savanna Creek 2A, 65 mi. south of Calgary and 24½ mi. south-southeast of the Turner Valley field. Although initial test in the top of the Madison got gas at a rate of 8.4-million cu. ft. daily, and the flow in the second test was even higher, officials believe the main producing horizon encountered at the discovery has not been tapped in this followup well.

Oklahoma—Three locations have been staked by Continental Oil Co. in the West Short Junction pool of Cleveland County. The company last week completed the 35th consecutive oiler in the area, without hitting one dry hole.

Sand Blaster Cleans Pipe Interior

The inside of pipe can be cleaned by a new tool which whirls sand or other abrasive substance under great pressure. Demonstrated last week on the West Coast by J. C. Fennelly Co. of San Francisco, the instrument is intended to replace pickling, chemicals, and turbine tools as a means of removing scale and other deposits. Cleaning is accomplished by passing the device through pipe of any size from ⅜ in. to 12 in. It is not necessary to rotate either the tool or the pipe during the operation; a conical diverter disperses the abrasive over 360°. The manufacturer says the tool is also valuable in cleaning heat exchangers, vacuum pans, condensers, and petrochem heaters. It's available in four sizes.

Forty billion barrels ago—



Measured in years, it is less than a century since Colonel Drake drilled the first oil well, in 1859. Measured in terms of the gigantic American petroleum industry which grew from his pioneering enterprise, the August day when his well spurted forth the long-sought oil was more than forty billion barrels ago.

Two thousand barrels was the output in 1859. About two billion barrels now come yearly from American wells to meet the demands of the modern motor and the varied other uses of petroleum products.

For decades, Sun Ship has played an important part in construction of the refinery equipment . . . fractionating towers, condensers, pressure vessels, machinery and other equipment . . . to meet these demands. The facilities, modern manufacturing methods and skilled personnel at the great Sun Ship plant provide a combination that has consistently shown its ability to serve the petroleum, chemical and petrochemical industries in the task of building a greater America.

Sun

SHIPBUILDING & DRY DOCK COMPANY

ON THE DELAWARE (SINCE 1916) CHESTER, PA.

25 BROADWAY • NEW YORK CITY

MERGER worked out by close friends Ralph Johnston (left) and W. Stewart Boyle, independent oil and gas producers from Houston, gave them both . . .

RALPH JOHNSTON—

"Joining forces with another small operator is the fastest, easiest way to the top."

STEWART BOYLE—

"If you don't act, think, and plan the way the man you're joining does, then you better think twice before going ahead."

A Shortcut to the Bigger Deals

It was a natural. Each of the producers, Stewart Boyle and Ralph Johnston, had something the other lacked. After merging their companies this summer, they now are realizing the benefits that come when independents in any part of the oil business get together.

Johnston was president of Johnston Oil & Gas Co. Boyle was president of Texam Oil & Gas Co. They had been friends for many years, and both had mutual financial interests in other companies. Their new company: Texas National Petroleum Co., Houston, with Johnston chairman and Boyle president.

This week the two men are completing plans for developing new leases, acquired since the merger, in Louisiana, New Mexico, and Wyoming. And in the next six months, they will be spending a lot of money and effort on developing properties already held in the San Juan Basin (New Mexico and Colorado).

In their pooling of resources for expanded operations, they are following the lead of dozens of other independents this year. Proposed or completed mergers literally run from A to Z in producing areas of the United States and Canada—from Amurex Oil Co.'s consolidation with Ponder Oils, Ltd., to that of Zuma Uranium & Oil Corp. with International Oil & Development Corp.

Why the rash of mergers? Rising costs, stiffer competition, and tougher going in the hunt for oil are making the road rocky for many small independents.

As Johnston explains, "It's not impossible for a small production company to grow big these days. But joining forces with another small operator is the fastest, easiest way to the top."

Boyle and Johnston didn't jump into their decision to merge. Before they shook hands on the deal, they had in mind some big advantages for both operations.

"The biggest single reason we decided to merge," says Boyle, "was the combined earning and financing power available to us as one company. Within weeks, the merger put us in a position to expand, develop new and old leases, and take larger calculated risks."

Texas National now has about $2.5-million to spend each year—$1.5-million from income, and $1-million readily available from Houston banks. The combined income will allow the company to take advantage of the great potential in nonproducing leases held by the former Texam Oil & Gas Co., since income from the old Johnston company can now be used to develop these reserves.

Also, by plowing income back into

expansion, Texas National will not be bothered by tax disadvantages resulting from the merger for at least two or three years.

"Now we can get in on some of the bigger deals," Johnston points out, "ones that wouldn't even have been offered to us when we were smaller. Other people now know we are interested, and big enough to take on almost anything.

Helping them is the solid credit reputation built up by both Johnston and Boyle for either short-term or long-term loans. And in with them as company directors are Lamar Fleming, Jr., E. O. Buck, and E. F. Gracey, all wealthy and well-known men in Houston oil and banking circles, plus F. Arthur Stoutt, of Midland, Texas.

"Another good reason for our decision," Boyle adds, "was our need to get balanced oil and gas reserves." This is a definite requirement for any company that wants strength and borrowing power to expand. Texam was primarily an oil production company. It owned a working interest in some 50 producing leases in Texas. And it had nonproducing leases in Louisiana, New Mexico, Colorado, Wyoming, Nevada, Utah, and Texas. It had little gas reserves.

"But Johnston's company," Boyle says, "had mostly gas reserves. It owned or had interest in properties in the San Juan Basin. So, Texam alone had good oil reserves, but practically no gas. Johnston had plenty of gas, but little oil. Together, we have a well-balanced operation, with some 16-million bbl. of oil reserves and 731-billion cu. ft. of gas reserves."

The benefits of this balance are summed up by one of Johnston's former executives, L. C. Oldham (now Texas National vice-president): "A lot of things can hurt you if you are long on one type of reserves and short on the other. Take imports. As we stand now, if oil imports cause cutbacks in domestic production, we will still be selling our gas. And the income from gas sales gives us part of the money to develop new wells. Even if crude allowables are cut, the production from these new wells coming in will hold the company's oil production up."

Johnston and Boyle also gained staff balance in their new company. Before the merger, Johnston Oil & Gas had no geological or exploration department. Texam had. The rest of the staffs worked in, too, to give Texas National a well-knit organization.

A key fact is that the two men were able to increase their resources, while still retaining unity at the top. The men are very much alike. As Boyle observes, "we just know how the other thinks."

Both men were offered chances several times to merge with other companies. "But in most cases," Boyle says, "we turned down other offers because the personalities didn't fit. That is the most important thing to look at when you plan to merge. If you don't act, think, and plan the way the man you're going to join does, then you better think twice before going ahead.

"But when Ralph and I started talking over the possibility of merging, there wasn't a single disadvantage we could see. And we still can't see any."

What's New / IN MANAGEMENT

A merger is solving the order-backlog problem of Garrett Oil Tools, Inc., of Longview, Tex., maker of gas lift and other oil field equipment. Garrett has been bought by U. S. Industries, Inc., of New York. Its operations will now be integrated with those of the USI subsidiary, Axelson Manufacturing Co., whose facilities for producing oil well equipment are termed "perfectly suited" to help meet the Garrett backlog.

•

Advanced aptitude testing is needed to help chemical engineering students make an early decision between specialization and generalization, says Bruce K. Brown, president of Pan-Am Southern Corp. He terms unsatisfactory the present "unguided selection" by students themselves. With improved testing, Brown points out, management will be able to identify early the students who never can become administrators—and encourage them to specialize.

•

Directors of Reiter-Foster Oil Corp. are saving money for the company by passing up directors' fees. John Van Kirk, president of the producing firm, which operates in the Mid-Continent and Southwest, says "it's a small item, but the directors are all interested in saving the cents to build the company." In one recent year, six directors met 23 times at $10 each a session—which meant that fees totaled $1,380.

•

The rate of return on stock investments in 38 big oil refining companies averaged 13.8% in 1953—the same as in 1952—according to a new Federal Trade Commission report. Sample stock returns: Jersey Standard, 16.4%; Texaco, 14.1%; Socony, 12%; and Indiana Standard, 9%.

It's a poor idea for companies to recruit college students "on the simple tactic of outbidding competition," warns Karl Hill, of Dartmouth College's School of Business Administration. In an American Management Assn. report, Hill says a high starting salary has little value if it merely means that future salary increases are slow in coming. The new man won't stay long, Hill adds, and word of the company's policy will get back to the campus.

•

The oil industry campaign to help private colleges solve their financial problems got a boost this month from Jersey Standard and five of its big affiliates. These companies set up a new Esso Education Foundation, which will make unrestricted grants to colleges. It has pledges of $1.5-million for 1955. Contributions to higher education by all U. S. industry now exceed $100-million annually.

•

When Reserve Oil & Gas Co. hits dry holes, the management believes in "wringing 'em dry." Jasper Tully, president of the Bakersfield (Calif.) independent producer, says it's unheard of for his staff to "save money" by taking fewer sidewall samples or running fewer logs than are needed to evaluate the hole fully. Field men are never blamed for a duster. But they are criticized for failing to get all the data on that duster that might be used in drilling other wells.

•

Husky Oil Co. last week declared its first common stock dividend—amounting to 25%. President Glenn Nielson says the move "is a means of reflecting the stockholders, increased equity, and of obtaining wider distribution and improved marketability of the shares."

PETROLEUM COMMENTS / By W. M. Jablonski

A Great Anniversary, and Some Trouble Spots

Next week marks the first anniversary of the official settlement of the Iranian oil crisis. And it's a doubly great anniversary. For it coincides almost exactly with Iran's second big step to strengthen its defenses against Soviet designs.

This highly strategic country on Russia's border has now decided to abandon its historic "neutrality," and to associate itself officially with the West. It is joining the Western-sponsored Turkey-Iraq-Pakistan defense alliance. Thereby, Iran will close the one big remaining gap in what Secretary of State Dulles has called the Middle East's "Northern Tier" defense line from the Bosphorus to the Indian Ocean.

* * * *

The West has good cause to rejoice over the turn of events in Iran since the 1953 ouster of Mossadegh—whose bankrupt, negative policy brought that country so perilously close to a Communist coup.

And it has every cause to be thankful for the statesmanship of leading American, British, and Dutch oil companies in forming an international oil consortium last year to revive Iran's huge, paralyzed oil industry, and thereby restore the country's main source of revenue. During the past twelve months, Iran's oil flow has been resumed on schedule. And with it has come an increasing flow of sorely needed revenues to Teheran's coffers.

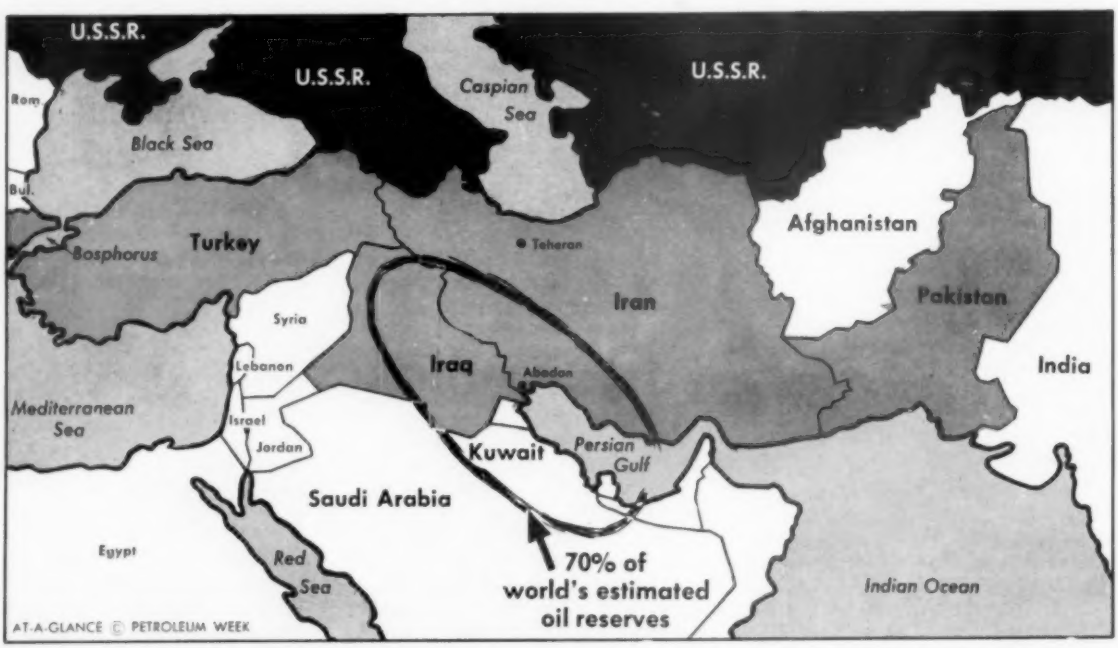
But while the American oil industry can take pardonable pride in its contribution toward revitalizing this country, it can't afford to write off this problem as entirely "settled." For it looks as if the oil consortium companies may still face some rough sailing ahead.

* * * *

Iran's internal political situation, never too stable, again shows some signs of potential trouble.

Amid a murmur of rumors that Mossadegh may be released soon from confinement, support for his "National Front" appears on the upswing. Evidence also indicates that some religious leaders are beginning to pick up the "Mossadegh Theme" in their sermons.

Segments of the Iranian press, too, have from time to time recently been displaying a strong anti-consortium tone. Articles have been appearing in some papers giving the impression that Iran's oil wealth is



ABOUT 70% of the entire world's known oil reserves lie within a small orbit around the Persian Gulf. It's defended by the new Turkey-Iraq-Iran-Pakistan alliance, which Secretary Dulles calls the Middle East's "Northern Tier" defense line.

being exploited unfairly by rapacious foreigners. The government is being more openly attacked for countenancing the agreement.

It's difficult, of course, to gauge the real impact of these trends. They may be merely a manifestation of the old Iranian psychological trait of blaming unsatisfactory domestic conditions on a foreign scapegoat. In the past the British had that role. Now that the oil consortium has filled the place formerly held by the British, it is clearly the new goat.

The question is not whether there will be criticism of the consortium, but how severe and widespread it will be—and whether it will get out of hand again.

* * * *

Western observers are generally agreed that what Iran needs at this time is a strong, "authoritarian" head of government.

Despite his vast personal popularity and restoration to power by popular acclaim, the 35-year-old Shah shows little inclination to use a strong hand. The Shah clearly wants to be a constitutional monarch and avoid personal rule. But at the same time, he also appears to shy away from appointing "strong" prime ministers.

General Zahedi, who restored the Shah to power and kept Teheran's mobs and bazaars under strong control last year, has left for reasons of ill health. And Finance Minister Ali Amini, the other Cabinet officer of exceptional strength of character, who was largely responsible on the Iranian side for the oil settlement, has been shifted to a less central post—Minister of Justice.

The present Prime Minister, Hossein Ala, is neither a "strong man" nor a popular leader. Unquestionably an honest and highminded individual of excellent intentions, Ala is completely loyal to the Shah, and a good friend of the U. S. But he is old, and in ill health. Though highly respected personally, he has no party behind him.

This in itself wouldn't mean much, because in Iran, politics rest on personalities rather than parties. But Ala has no large following in Parliament, little contact with the younger group, and little appeal to the masses.

And political observers have little hope, judging from present indications, that the Shah is likely to pick a much stronger man to succeed Ala.

* * * *

Much of the consortium's success, and its future stability, depends on the success of the government's Seven-Year Economic Development Plan—to be financed with the oil revenues. Glowing promises have been made about what it will do to improve the economy and raise the people's miserably low standard of living. Public expectations are high.

But there are troubles here, too. The Plan Organization is headed by A. H. Ebtehaj—a brilliant, honest, energetic man, aggressive sometimes to the point of truculence. He has insisted on full control over the operation and finances of the development program, determined not to let it bog down in the traditional inefficiency and corruption of existing government agencies.

But this has gained him, and the Plan, many influentual and powerful enemies. The old-line government ministries (agriculture, public health, etc.) feel their work is being duplicated, and resent efforts to leave them out in the cold. The Ministry of Finance objects to having no voice in the financial control of the major part of the government's annual expenditures. Such conflicts have caused much back-knifing and many delays in final formulation of detailed plans.

Even without all these political problems, getting under way such a vast development program—communications, agriculture, social welfare, etc.—would be bound to take much time. This is particularly true in as economically backward an area as Iran—where almost everything, including technical and administrative know-how, must be brought in from outside, and where local inefficiencies are apt to pile bottleneck upon bottleneck.

The public is already beginning to show signs of restiveness over lack of "results." Continued delays in tangible, publicly visible benefits from the oil settlement may provide fertile ground for opponents of the pact—and there are many—to preach "another sell-out to foreigners."

* * * *

And last, but not least, there is the Soviet Union's new offensive in the Middle East—as witnessed by the recent Soviet offers to arm Egypt and other Arab states, the promises of technical assistance, etc.

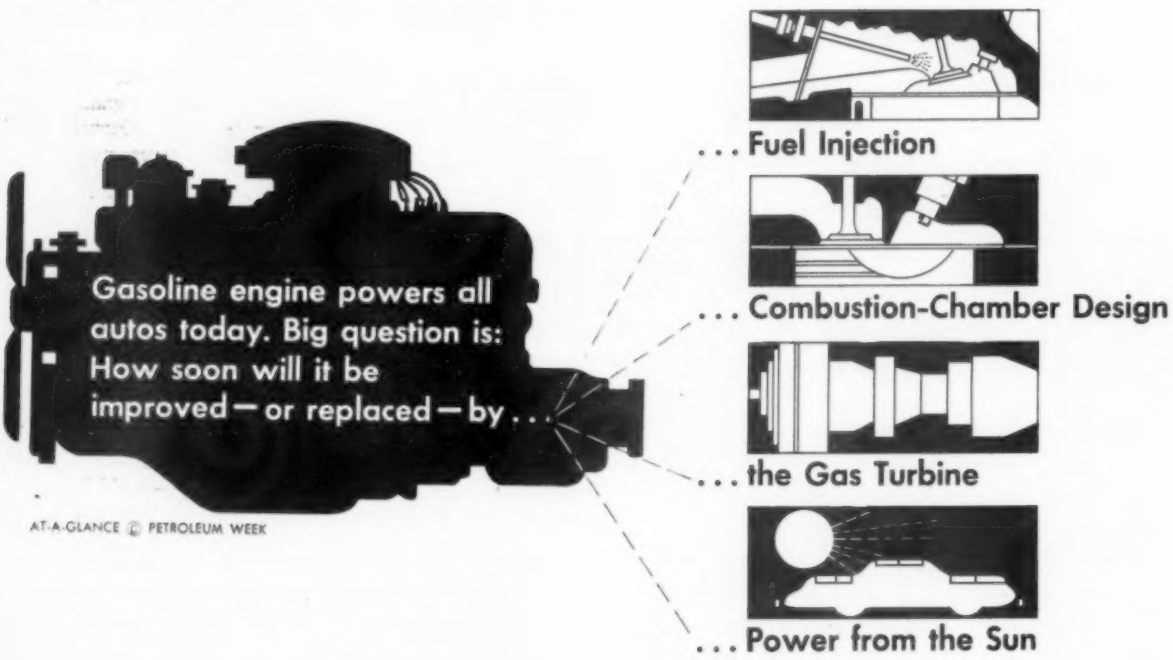
True, Russia's "good will" drive has received one major setback: the failure to stop Iran from joining the Western alliance. But one can be sure that this will only prompt Moscow to redouble its efforts to stir up trouble.

And the biggest target, of course, is the Western oil consortium—upon whose success depends Iran's entire potential economic growth and strength. Sufficient evidence exists to show how effectively Soviet agents helped fan mob feelings against the Anglo-Iranian Oil Co.'s operations in the past. There's plenty of room for clandestine work again among some of Mossadegh's ultra-nationalistic, extremist agitators, and among the illiterate mobs in Teheran's teeming slums and bazaars.

* * * *

The sum total of all these factors adds up to potential trouble spots ahead.

The West has every reason to celebrate the first anniversary of Iran's oil settlement with optimism—but it should be an optimism tempered with continued alertness and watchfulness.


Gasoline engine powers all autos today. Big question is: How soon will it be improved—or replaced—by . . .
AT-A-GLANCE © PETROLEUM WEEK
. . . Fuel Injection
. . . Combustion-Chamber Design
. . . the Gas Turbine
. . . Power from the Sun

Let's Take a Look at Tomorrow

Exciting, perhaps revolutionary, changes and improvements in automotive power plants are coming within the next decade. Their impact will pose dramatic new challenges to all segments of the petroleum industry.

There's no arguing that today's gasoline piston engine is a highly efficient power plant. But its efficiency may not be enough to keep it on top for another 10 years, despite the fact that it's sure to be improved greatly in that time.

There are many indications which point to development of entirely new types of fuel. Octanes may become an obsolete term in our time. Even gasoline as we know it may no longer flow from refining units to service station pumps. New engines will mean new fuels, new patterns, and new challenges to the oil industry, so heavily reliant on the automobile.

To determine the present status of automotive engine developments, and their future outlook, Petroleum Week has made a detailed survey of the field. The survey shows these development trends:

- **Fuel injection** is just around the corner, may make its appearance within two years.
- **Combustion-chamber designs** are being altered, with consequent changes in the quality of gasoline.
- **Gas turbines** should be showing up within five years, may displace piston engines entirely within 20 years. A combination gas turbine-piston engine is a distinct possibility.
- **Solar power** may be harnessed efficiently enough to operate a motor which would propel an auto. But the odds are long.
- **Other possibilities** include two-cycle engines, used heavily at present in outboard motors and in some small European cars, and atomic power. But a lot more has to be learned about atomic power before it can be given serious attention.

Cost will, of necessity, play a big part in deciding when, if ever, any of these developments become practical actualities. Buyer appeal will be the other major determinant. If an automobile sales department feels a new engine or fuel system will help sell cars, negative factors—such as higher cost or lower efficiency—may be disregarded.

Too, some ideas may never get beyond the drawing board stage. Others will be tested and found wanting. But some will get through, and they will have tremendous impact on the kinds and quantities of fuel which will be in demand.

Here's the status of engine changes and improvements currently receiving most attention in automotive research laboratories and testing grounds:

Fuel Injection

Fuel injection of some sort will make its appearance on a small scale in some 1957 model cars. This will replace carburetors, increase horsepower, boost mileage (PW—Sep.16 '55,p12).

Fuel injection is not really new. Diesel trucks have used it for some time; race-car drivers found its value many years ago.

In present gasoline piston engines, fuel pumps pump gasoline from the tank to the carburetor, which mixes the gasoline with air and delivers the mixture to the intake manifold—essentially, a tube for carrying the mixture to the engine intake-valve ports. From the intake-valve ports, the mixture enters the cylinders. Fuel injection systems eliminate the carburetor and deliver the fuel directly into the combustion chamber or into the intake manifold, according to which of two types of fuel-injection systems is used.

At first, injection probably will be into the intake manifold, rather than directly into the cylinder. This is because direct injection would involve

redesigning of today's engine head, a costly factor.

There are two basic types of fuel injection — metered injection, and continuous flow. Metered injection seems to be favored, but continuous flow is cheaper.

In the continuous-flow system, the key unit is a fuel pump driven by an electric motor. When the engine is idling, or the car decelerates, less current is fed to the electric motor. This reduces the flow of fuel. When the car is accelerating, the motor speeds up and the engine gets more gas.

In the metered-injection system, an intricate metering pump is used to supply a metered amount of fuel to each cylinder for each stroke of the piston. The amount of fuel injected depends on manifold pressure.

Even if fuel injection effects a cut of 5 to 10 numbers in octane requirements, as proponents claim, there's little chance refiners will be able to cut back on octanes. Reason: Engines probably will be modified to take advantage of the saving, to raise horsepower even higher.

Tests have shown that a car equipped with fuel injection can deliver from 6% to 7% more power. Claims are made that this can be increased up to 25% if a gasoline engine specifically for fuel injection is designed.

Du Pont, which is testing a stock-model Lincoln with fuel injection, says the system reduces fuel octane requirements from 5 to 10 numbers. But automotive engineers, historically, have designed their engines to make use of all the octane they can get. So if fuel injection saves octanes, odds are engines will be beefed up to use the extra octanes.

Refiners may benefit in other ways, however. American Bosch says fuel injection will permit use of wider-cut fuels. And, because higher-vapor-pressure fuels may be used with the pressurized fuel system, lead requirements will be cut.

II. Combustion Chamber

New combustion-chamber designs in the works will add more mechanical octanes to the already efficient piston engines powering today's cars. The end result, however, may be higher compression ratios, rather than lower fuel requirements.

Some of the designs under consideration involve minor changes in the shape of the chamber in the cylinder head, others take a rather drastic departure and move the chamber down into the piston, with little, or nothing, left in the head.

Designers of gasoline piston engines have been spurred to new studies and developments by a new German diesel engine, which uses fuel injection into a chamber wholly machined out of the top of the piston.

The Maschinenfabrik Augsburg Nurnberg engine overcomes many of the complaints about diesel engines, such as knock, general noise, smoke, and fuel sensitivity. The M.A.N. engine is a multifuel plant that will operate on either high- or low-octane gasoline, almost all grades of diesel fuel, kerosine, purified crude, and even crankcase oil.

Best bet right now is that some engine design will be evolved which will minimize necessity for high octanes, help ease the petroleum industry through the transition period before gas turbines come into use.

There is a growing feeling among automotive engineers that research into combustion-chamber design may open the door to an engine which eventually will operate on gasoline with octane rating as low as 70 to 80, research.

III. The Gas Turbine

Gas turbines are expected to show up in passenger cars by 1960, be in quantity use by 1965 (PW—Oct. 14'55,p11).

There is particular significance in the prediction by A. A. Kucher, director of Ford Motor Co.'s Scientific Laboratory, that automotive gas turbines will be on the road by 1960. His statement was the first made by an automotive spokesman in which a definite time limit was set.

Gas turbines will work radical changes, cause repercussions throughout the oil industry, from wellhead to service-station pump.

But oil men will get sufficient time to make the transition from production of high-octane gasoline to production of whatever fuel turbines will require. Since piston engines will continue to be built in volume for at least 15 more years, and perhaps longer, there will be a continuing heavy demand for automotive gasoline in that period. Turbine men would like to see a straight-run, unleaded gasoline available for the first turbines. But they'll probably compromise on available gasolines at first.

IV. Power from the Sun

General Motors already has introduced a midget car powered by the suns' rays. But a big step-up in the energy that can be harnessed by this method is necessary before it rates serious attention as an automotive powerplant.

GM's 15-in. "car" is equipped with 12 photoelectric cells on its top, which convert light into electric power. Current from these cells operates a tiny motor that propels the vehicle. Query: If it works in a model, then why not in a full-size car? Answer: Not enough power is generated.

The sun delivers sufficient energy to one square yard of land in 24 hours to be converted into one horsepower at present rates of conversion. Today's automobile has about 6 sq. yd. of exposed surface. That means it could convert, at most, about 6 hp. every 24 hours from the sun's rays.

But solar power can't be written off entirely. A year ago the efficiency of converting sun rays to power was about 4%. Today it is about 15%, indicating scientists are breaking through the research barrier.

V. Other Possibilities

In Europe there is increasing use of two-cycle engines, which can raise horsepower by about 40% over present four-cycle engines with the same number of cylinders. But two-cycle engines operate roughly and at low speeds. Also they require constant and expert maintenance to remain adjusted.

The four-cycle engine requires four piston strokes (intake, compression, power, and exhaust). In the two-cycle engine, the intake and compression strokes, and the power and exhaust strokes, are combined, to permit the engine to produce a power stroke every two piston strokes.

European users of two-cycle engines report good performance at high speeds, erratic performance at low speeds. Best guess is that such engines will remain most popular in the outboard motor category but will not be a factor in American car use.

Research continues on atomic power. But concensus of automotive engineers is that atomic power for cars isn't in the cards for the near future, and possibly may never be.

One engineer points out that there is a big difference between developing an atomic powerplant for the military, at any cost, and producing one to fit the public's pocketbook.

Atomic powered automobiles would wreak havoc with the oil industry, were such a development to come comparatively soon. But the threat appears to be academic—now.

Action by three companies, three governments brings . . .

Trans-Canada Gas Line Near Reality

Canada's cross-country pipeline, connecting Alberta gas fields to Ontario customers, moved closer to reality last week. But, it develops, half of the line will be built by the Canadian government. And the whole project depends on an application now before the U. S. Federal Power Commission.

Even at its simplest, the cross-Canada line is a complicated setup. It involves the governments of two nations and one province, three pipeline companies, and a lot of "ifs." In brief, here's how it will work:

The Dominion government will build the eastern portion of the line, across Ontario, if Trans-Canada Pipe Lines, Ltd., will build the western section from Alberta to the Ontario-Manitoba border. But Trans-Canada can't finance its part of the line until it gets customers. Right now, there just aren't enough would-be gas users in eastern Canada to absorb the capacity of a 30-in line. So Trans-Canada has been looking for ways to sell gas to a U. S. concern, to assure revenue so that it can sell its bonds.

It hopes Tennessee Gas Transmission Co. will fill that spot. Last week, TGT applied to FPC to import Trans-Canada gas for American midwest customers, and export American gas to Ontario customers. This contract will allow Trans-Canada to finance its line, so that the Dominion government will build its line. But the whole thing depends on whether or not FPC approves the TGT application.

To finance the Ontario section of the line, the Dominion government will form a crown company with the Ontario provincial government. Last week, the Dominion agreed in principle with Ontario to build the line. The company will probably be owned 60% by the Dominion and the rest by Ontario. Together, the two governments will probably put up $120-million.

Once the line is built, the crown company may lease it to Trans-Canada outright, or it may operate it itself and charge a transmission fee for gas movement. Trans-Canada will probably get an option to buy the Ontario line from the crown company at a price that would repay the two governments.

Plans call for the Ontario line to be 1,200 mi. long. Pipe will be 30-in. Bechtel-Mannix-Hester, a Canadian firm, will probably lay the Ontario line. Final surveys and acquisition of property rights for the line is planned for next year. So construction may start late next year, finish late in 1957.

The final bit of the deal didn't fall into place until last week, when Tennessee Gas Transmission Co. applied to FPC to import Canadian gas for the U. S. Midwest, and export gas to eastern Canada. Trans-Canada and TGT have already signed contracts for the deal (PW—Aug.26'55,p30).

TGT's application involves a three-part request:

- Midwestern Gas Transmission Co., a wholly owned subsidiary of TGT, wants to build a $98-million line from Trans-Canada's terminal at Emerson, Manitoba, to tie in with TGT's line at Portland, Tenn. This line, with laterals, would serve customers in four states — Minnesota, Wisconsin, western Michigan, and

eastern North Dakota. Size of the 1,112-mi. line is not known, but it will have a capacity of 400-million cf/d. In addition to the main line, Midwestern will build 650 mi. of laterals.

- TGT asks to export 83,755,000 cf/d of gas to Trans-Canada at Niagara Falls, N. Y. This is part of the TGT-Trans-Canada contract.
- TGT also asks to expand existing facilities in Kentucky, Ohio, Pennsylvania, Tennessee, and Massachusetts. These expansions will cost $24.3-million, and will involve 162 mi. of new pipeline, two new compressor stations, and the enlarging of four other compressor stations.

All told, TGT and Midwestern will spend $140-million on the projects. TGT will increase its capacity from 1.6-billion cf/d to 2-billion cf/d. The projects are timed for the 1956-57 heating season.

(At Washington, D. C., late last week, the National Coal Assn. said it would oppose TGT's application before FPC. The association termed TGT's proposal as "merely another attempt to have Americans subsidize the building of the all-Canadian natural gas pipeline.")

Finances have been the big stumbling block for Trans-Canada. It received its franchise to build the complete Alberta-Ontario pipeline in 1954. But it wasn't able to sign up enough customers in eastern Canada to satisfy the bond underwriters that it could pay interest during the first few years of operation.

About the same time, Trans-Canada signed to supply Northern Natural Gas Co., of Omaha, with 100-million cf/d. This fell through when FPC deferred Northern Natural's application to import gas. The commission wanted assurance that Trans-Canada could deliver the gas.

Next, Trans-Canada applied to the Dominion for assistance in getting the line started. The government refused to guarantee the company's bonds, but offered to advance capital and take equity in the line. This didn't suit the owners of Alberta gas fields; they refused to sell gas to Trans-Canada under those conditions.

Trans-Canada had good intentions, but no customers. And without them, it couldn't borrow money for its line from Alberta to Ontario. Its franchise to build the line expired last December. This was extended, but now that, too, is expiring.

With TGT gas, Trans-Canada can start at once to build up the market for natural gas in eastern Canada—in preparation for the day when Alberta gas will start flowing.

Ontario is a region where natural gas hasn't been widely used. The two years or so before Alberta gas starts flowing will give Trans-Canada a chance to educate customers to natural gas uses.

The Dominion government figures the Ontario line as a long-range proposition, one that will take a long time to show a profit. Business is building up in the Ontario area, and the prospect of gas will probably bring more in. In addition, the St. Lawrence Seaway is under construction, and will attract new business.

The Canadian government has always insisted on Alberta supplying eastern Canada via an all-Canada pipeline, instead of a line that came through the U. S.

It is firm Dominion policy that Canadian gas can't be exported until actual and potential markets in the country are assured of supply. The government doesn't want Canada to have to depend on a line through the U. S., because it feels service on such a line might at sometime be interrupted by events beyond Canada's control.

The Dominion government had to step in and build the Ontario line for one big reason: It turned out to be too expensive a project for any private outfit.

The Ontario line will have to be built across rugged northland forest, and swamp, and through barren areas with hard rock right on the surface. And the whole route is far from urban areas where prospective customers along the line could offer revenue.

In addition, the Dominion can borrow the money at 3% interest, or less, carry the financial burden for 5 or 10 years, then sell the line to a private concern at no loss. Trans-Canada would have had to pay interest of around 4½% to 5%.

What's New / IN TRANSPORTATION

The Air Force last week identified three pipeline companies that are negotiating with the service to supply jet fuel to six bases (PW—Oct. 14'55,p32). Southern Pacific Pipe Line Co., now constructing its El Paso-to-Southern California line (PW—Aug.5'55,p26), wants to supply fuel to Luke, Williams, and Davis-Monthan Air Force bases in Arizona, and March Air Force base in California. Triangle Pipeline Co., of Shreveport, wants to supply Barksdale (La.) Air Force base. Mayflower Pipe Line System, a paper organization, has applied for fast tax writeoff on a 218-mi. line from New Jersey into New England that would tie in with Westover (Mass.) Air Force base.

•

One of Japan's largest refiners, Maruzen Oil Co., plans to build a 33,500-ton tanker at Kobe (Japan) shipyards. Maruzen is the Japanese distributor for Union Oil Co. of California.

•

Wasteful flaring of natural gas in the Tioga (N. D.) field is due to halt. Montana-Dakota Utilities Co., of Minneapolis, has Federal Power Commission approval to build a pipeline from Tioga to Williston, N. D. At Williston, the line will feed into the Montana-Dakota system and flow to Montana-Dakota's underground storage areas in southeast Montana. Gas has flared at Tioga—up to 20-million cf/d of it—all during the field's 4½-year-old history.

•

Peru's unique east-of-the-Andes pipeline, the only one of any size in the Amazon River watershed, is expected to be complete by the end of this year. Owned by Ganso Azul Petroleum Co., a subsidiary of Texas Gulf Producing Co., the line connects the Aguas Calientes field to the river-port terminal of Pucallpa. Crude from the field will flow the line during the low-water summer period when barge transportation can't reach the field.

•

Peace River Oil Pipe Line Co. expects to start the first crude flowing from Alberta's Sturgeon Lake area by Dec. 1. The company's contractor is now completing the 106-mi., 12- and 16-in. line from the area to Edson, Alberta, on the Trans-Mountain Pipeline. Six companies are incorporated into Peace River: Canadian Gulf Pipe Line Co.; Imperial Oil, Ltd.; Shell Oil Co.; Union Oil Co. of California, Ltd.; Hudson's Bay Oil & Gas, Ltd.; and Amerada Petroleum Corp.

Rather than market Rumanian oil . . .

Esso Shuts 900 Finnish Pumps

Jersey Standard's marketing affiliate in Finland has cancelled its fuel oil contracts and shut down 900 gasoline pumps rather than handle Rumanian products.

Three years ago Oy Esso A/B and the two other western companies in Finland agreed to distribute Russian products temporarily when the Finnish government partly replaced their supplies with U.S.S.R. imports because of severe foreign currency difficulties. The government promised in return that imports from their own western sources would be re-established as soon as its currency position improved.

Boycott of Rumanian oil products by western marketing firms started this year when the Finnish government failed to honor its agreement to re-open the country to their imports. At the end of last year, despite a greatly improved currency situation, the government signed a new contract with the East, this time with Rumania, for supply of 20% of its 1955 product needs. This was in addition to the Soviet contract, which will continue another two years. The two contracts meet virtually all of Finland's oil needs.

Esso is consequently undersupplied, as a result of shortage in western supplies and its refusal to handle Rumanian products. It has virtually no heavy fuel oil and insufficient gasoline. It chose, therefore, to remove a large number of gasoline pumps which it describes as "obsolete and uneconomic," and cancelled contracts for deliveries of heavy fuel oil.

The two other western distributors in Finland, Shell and Gulf, are faced with somewhat similar problems. Gulf is not in the fuel oil business.

Together, the three companies distribute about 70% of Finland's oil products. The rest is marketed by three Finnish and two Russian firms.

It looks now as though the western oil marketers' holdout for imports from their own sources may be resolved in a compromise agreement with the government next month. Negotiations are currently under way, and the three companies are hopeful that the improved currency position of the Bank of Finland is keeping the door open for a solution.

Meanwhile, Rumania has fallen down on its fuel oil deliveries. Ironically, the Finnish government recently allocated £350,000 ($980,000) to a Finnish fuel distributor for purchases in western markets.

Any agreement reached between the government and the western marketers on Finland's future oil imports from western sources may also have a bearing on crude oil imports for Finland's first refinery. This is now being built for the government-controlled Neste Oy, an oil storage company, by Lummus Co., of New York. It is scheduled to go into full production in the fall of 1957, with initial capacity of 18,000 b/d. The western marketers—it's believed in Finland—probably will refuse to handle the refinery's products unless a fair proportion of its crude supply comes from their own sources.

Premier Segni, ENI President Mattei, and Industry Minister Cortese are key figures as...

Battle Shapes Up Over Oil Law

Three key figures will play an indirect but significant role in Italy's Parliamentary debate next month on revision of its oil law. The reason: They represent the conflicting views of Italy's coalition government on relative roles of state and private development of oil resources.

Steering the middle course in an attempt to balance state control and private enterprise is Premier Antonio Segni (left, above).

Strongest partisan of private capital is Minister of Industry Guido Cortese (right), who would like to see foreign oil companies bringing in the development funds Italy needs.

The opposing extreme is represented by Enrico Mattei (center), president of ENI, which holds a monopoly of exploration in the Po Valley. He feels the government should hold all exploration rights on the mainland (Sicily has a regional law of its own), to develop on its own or to transfer to private companies as it elects.

The final draft of amendments to be presented to Parliament represents a compromise on these views. It was drawn up by Cortese and passed on to Segni earlier this month.

Broadly, it aims at three objectives: to preserve the ENI monopoly in the Po Valley; to open the rest of the mainland to private companies on an equal basis with ENI; and to reserve the government's right to extend the ENI monopoly to additional areas in certain cases—as, for example, where private companies fail to develop their holdings.

Unofficial reports from Rome indicate exploration areas will be limited to 20,000 acres, with a maximum for one company of 120,000 acres. Exploitation rights will be limited to 4,000 acres in any one area, with a total company maximum of 32,000 acres. Royaltics will be progressive, starting at 12.66%.

But the individual views represented in the compromise amendment draft still remain to be battled out by their respective partisans in Parliament. Only the first step has been taken in years of controversy. This is the first time the fight has ever moved onto the open floor of Parliament.

To locate your friends

at the November **API Convention** in San Francisco

Telephone McGraw-Hill Petroleum Publications'

Convention Registration **Information Center**

GArfield 1-5841

- The Information Center operators will be able to tell you if the customer, prospect or friend you are looking for is registered and, if so, what hotel he is staying at and what his room number is. They also will be able to give you company-suite locations.
- Phone booths with direct lines to the Information Center will be located in the lobbies of the Sheraton Palace, St. Francis, Fairmont and Mark Hopkins.

This service will be supplied courtesy of

McGRAW-HILL
PETROLEUM PUBLICATIONS

Petroleum Week	**National Petroleum News**
Petroleum Processing	**Platt's Oilgram News Service** **Platt's Oilgram Price Services**

What's New / ABROAD

Oil in Tijuana?

MEXICO—An oil find has been claimed by the state of Lower California in the city of Tijuana, near the U.S. border. But the Mexican government's oil monopoly is reserving judgment on its significance.

The find was announced this month by Gov. Braulio Maldonado, in his first annual report to the state legislature. Analysis and early studies of oil samples, as well as the geology of the area, he told the legislature, indicate existence of a large oil field in the northern part of the peninsula.

Officials of Petroleos Mexicanos, however, are not ready to confirm the value of the oil find, which was made by U.S. and Mexican experts hired by the state. Pemex geologists and engineers have been sent to the area for an official study of the reported discovery. If they confirm the findings claimed, Pemex says, "We will send drilling crews and equipment to the area immediately."

Pemex currently is carrying on exploratory drilling in two basins in the central and southern coastal regions of Lower California, after more than five years of surface geological mapping (PW—Jul.22'55,p28).

•

Iranian-Italian Refinery ?

ITALY—An Italian firm that made an oil-purchase deal with Dr. Mossadegh at the height of the Iranian oil dispute is now trying to form a joint Iranian-Italian refinery. The proposal is still in a speculative stage.

The plant would be owned jointly by the Iranian government's National Iranian Oil Co., and by "Supor," a company formed here in 1953 to buy nationalized Iranian oil. Supor was unable to move more than a small quantity of oil during the dispute. In 1954, after settlement of the Iranian crisis, its contract was renewed by the National Iranian Oil Co. Even then, however, it was unable to ship more than 200,000 tons out of its scheduled 1.5-million tons, due to inability to find refiners.

The company is now reported close to bankruptcy, and is exploring the possibility of building the joint plant to process this crude.

Special approval would have to be received from the Italian government, which presently has a general ban against erection of new refineries. The country's refining capacity already totals 23-million tons (about 460,000 b/d), of which only about 60% is being used. Earlier, the government turned down a Supor request that Rome invoke its authority to force refiners to process Supor's crude up to 10% of their capacity.

•

Red Oil Trade Holds

Shipments of Russian and Rumanian oil to non-Iron Curtain countries held at a point only slightly behind last year's average level in the first eight months of 1955. If the step-up in shipments that occurred in the last quarter of 1954 is repeated this year, it looks as if this year's over-all average might top last year's record of about 90,000 b/d (PW—Aug.12'55,p33).

This year's eight-month shipments total approximately 22.4-million bbl., of which 12.6-million were loaded at Russia's Black Sea ports and 9.8-million at Rumania's port of Constanza. The largest shipments were consigned to Finland, Sweden, and Argentina. Approximate quantities shipped were: Finland, 4.3-million bbl.; Sweden, 3.5-million bbl.; Argentina, 3-million bbl.; Egypt, 1.8-million bbl.; Italy, 1.8-million bbl.; Israel, 1.6-million bbl.; Iceland, 1.2-million bbl.; Greece, 1.1-million bbl.; France and French North Africa, 791,000 bbl.; and Yugoslavia, 469,000 bbl.

The total shipments—some of which may have been transshipped—included 3.5-million bbl. of crude oil from Russian ports, about 14-million bbl. of black products (mainly residual fuel oil), and 4.9 million bbl. of gasoline, kerosine, and other products.

•

EGYPT—The Arab League wants to bar oil shipments to Israel—not only from the Middle East, as at present—but also from "any other country."

This will be the main concern of the League's Petroleum Committee in a meeting scheduled for Nov. 5 in Cairo. The committee will discuss proposals for a unified oil policy among member countries (PW—Sep.9'55, p24). Iraq has accepted an invitation to attend. Also attending for the first time will be observers from the oil-producing sheikhdoms of Kuwait, Bahrein, Muscat, and Qatar. Other members at the meeting will be Egypt, Saudi Arabia, Syria, Lebanon, Jordan, and Yemen.

•

ISRAEL—The companies that brought in Israel's first oil strike will invest between $6-million and $10-million in drilling additonal wells to define the Heletz field and to develop their other concessions. Lapidot—Israel Petroleum Corp. and Israel Oil Prospectors Corp., Ltd., last week suspended drilling at their Huleiqat wildcat near Heletz after hitting a second pay level. The second zone is 16 ft. of oil-saturated sandstone and was encountered at about 4,946 ft., some 40 ft. below the first shallow 6-ft. pay level. Both oil bearing zones are in the Lower Cretaceous.

Oil in the first zone has now been analyzed as 30.6-gravity. Although definitive analysis of the oil in the second pay level has not yet been made, company geologists say it looks "a good deal better." Production tests on the second zone will start in the next few weeks. Meanwhile, plans are under way to drill two wildcats to test the Heletz field. They will be spudded northwest and southeast of the Huleiqat well at points about 1,312 ft. apart.

A new stock issue is expected to be offered both in Israel and the U. S. to finance further development of holdings of the two companies. They have now set up a new joint prospecting company, which is surveying the area between Huleiqat and the Migdal Ashkelon railhead with a view to laying a 5-mi. pipeline to carry crude oil from the well. Currently the president of AMPAL American-Israel Corp., New York, is in Israel studying the capital requirements of Lapidot-Israel, in which it owns a 31% interest through American Israel Petroleum Corp.

•

INDIA—A Caltex affiliate is planning to finance its new $25-million refinery through sale of debentures in India and the United Kingdom. Caltex Oil Refining (India), Ltd., will soon offer $4.2-million worth of debentures in India and another $8.4-million (£3-million) in the U. K. The balance of the financing will be arranged through capital subscription.

Construction has already started on the plant at Vishakapatanma, a port on India's east coast. It is scheduled for completion early in 1957, with a throughput capacity of 13,500 b/d of

crude. Caltex has a 25-year guarantee against nationalization of the refinery.

The Indian debentures will be sold at par in multiples of $1,050; interest rate will be 5¼%. Caltex reserves the option of redeeming all debentures issue at 101% on Oct. 1, 1965.

Bombay stock brokers say public demand is overwhelming. They're expecting the issue will be taken up within an hour after it is floated.

•

ITALY—The government-owned company that struck oil twice last month in the Abruzzi region will deepen the first of the two wells and will drill in the surrounding area to test the extent of its field. Somicem, an exploratory subsidiary of Ente Nazionale Idrocarburi, will drill to 9,840 ft. in the Valle Cupa well which struck oil at 1,640 ft. The company has now revealed that the find was made in an oil-saturated porous calcerous layer, and that the oil is 35-gravity, API (PW—Sep.23'55,p29).

Officials say the Abruzzi find is not connected with Gulf Oil Corp.'s Cygno discoveries in the same region. The Valle Cupa well is only 2-mi. from Cygno No. 1. Rock and pay formations are said to be of the same origin, and oil gravity is similar. But, they say, there is a clearly evident fault fracture between the two locations. ENI's second oil find in the region last month was made at a depth of 9,840 ft., at Vasto. Gulf's Cygno No. 2 found a second and deeper stratum at 7,544 ft. after its first oil bearing zone was struck last spring at 2,604 ft. (PW—Oct.7'55,p28).

No details have yet been announced on the Vasto discovery, now designated as the Casalbordino Well. The find, almost 62 mi. from Valle Cupa, is said to represent a different field. Crude gravity also reportedly differs. Somicem has already started exploration north of the area.

•

COLOMBIA—Shell Condor has been granted new oil concessions near its producing Casable field, the largest in Colombia. The 65,618-acre concession is located in Antioquia Department. Shell is awaiting approval on its application for a 241,506-acre concession in the undeveloped eastern Llanos.

•

FRANCE—A newly formed French company has been granted exploration concessions of almost 1½-million acres, part of them offshore. Cie Francaise des Petroles (Gascogne) was organized by Cie Francaise des Petroles and Pechelbronn to explore the concessions for which CFP had applied some time ago, and which have now been granted. The areas include 1,238,989 acres in the departments of Dordogne, Lot-et-Garonne, Charente, Charente-Martime, and Gironde, in Western France. An additional concession of 239,692 acres in Charente-Maritime includes 27,672 acres offshore.

•

INDIA—Rumanian drilling equipment will be displayed at the Indian Industries Fair opening in New Delhi Oct. 29. A complete heavy rig designed for drilling to 9,800 ft. will be featured in Rumania's display, along with other oilfield equipment. The fair will be one of the largest ever held in Asia. Twenty countries will be represented, with the U.S. having the biggest exhibit.

•

U.S.S.R.—The first refinery in Siberia is now on stream at Omsk. Capacity is not disclosed in reports from the Russian press.

The government meanwhile has reiterated that it will reach its crude oil production target of 70-million tons (roughly 1,400,000 b/d) this year. More than half of it is being produced in the Bashkirian and Tatarian fields.

•

SYRIA—Priority action will be taken on establishment of a 20,000 b/d refinery by Syria's National Development Board. The sum of $22-million has already been allocated for the project in the government's recently approved budget. Syria has been considering setting up a government-owned refinery for about eight years, and reportedly has decided on locating it at Homs. Iraq Petroleum Co. has its Syrian headquarters there, and its pipelines pass through the town from Iraq en route to the Mediterranean terminals of Banias, Syria, and Tripoli, Lebanon.

•

UNITED KINGDOM—Even in coal-producing Wales, there's talk of switching to oil, in line with the trend evident in other areas of the British Isles and western Europe. Because of record deficits in the coal industry, the Production & Export Promotion Committee of the Industrial Assn. of Wales & Monmouthshire says Welsh industries should be ready to convert to oil at short notice. The time has come, the committee says, when coal is no longer an ally in the struggle to stabilize production costs.

Eight-Month-Old Refinery to Open Officially

Next week will mark the official "opening" of British Petroleum Co.'s 60,000 b/d Kwinana Refinery, near Fremantle, in Western Australia. The largest refinery in Australasia, Kwinana actually went into operation last February. By midsummer it had processed more than 7-million bbl. of Persian Gulf crude oil for BP's market in Australia and New Zealand. The plant was built in 27 months at a cost of $84-million. Products include gasoline, kerosine, and diesel and fuel oils.

'Tailored' Gasoline Coming

Refiners are nearing the time when finished automotive gasoline will represent a better-controlled blend of essentially pure hydrocarbon types —olefins, aromatics, paraffins, and naphthenes.

A manufacturing procedure will be necessary to make the 100-research-octane premium motor fuels that are expected to be in general use by 1960. This prediction was made by F. D. Buerstetta and T. W. Warren, of Ethyl Corp.'s research laboratories, to the California Natural Gasoline Assn., at Los Angeles, last week.

This means that in making the required higher-octane gasolines, refineries in the future will use materials designated by hydrocarbon types rather than primarily by boiling ranges. This would give refiners a better control of various quantities of blending stocks to be used with the unconverted, or natural, material going into finished gasoline.

In making present-day gasoline, refiners divide the fractions of crude oil by boiling range, and are mostly concerned with the hydrocarbons in the 200F to 400F range. From this comes a natural gasoline "cut" of low octane number. It is upgraded in octane by blending with some of the higher-octane and more volatile material in the lower boiling ranges.

The incentive for more careful blending of hydrocarbon types to make automotive gasoline is primarily economic, since the cost of each additional octane number near the 10 level may increase by as much as 15¢ to 20¢ a bbl., according to the two Ethyl scientists.

Because of this, refiners will have to concentrate more on using those hydrocarbon components that will provide optimum octane requirements, at lowest cost, for satisfying the maximum number of cars on the road.

As a guide to the maximum utilization of available raw material in making high-octane gasoline, Ethyl conducted a study to establish the relative contributions of the four hydrocarbon types to engine antiknock behavior. This behavior was related to such variables as (1) research and/or motor octane number, (2) fuel antiknock quality level, and (3) tetraethyl lead concentration.

The technique involved the use of mixtures of iso-octane and normal heptane as the paraffin constituent. Toluene, di-iso-butylene, and methyl cyclohexane were selected to represent aromatics, olefins, and naphthenes, respectively.

Each of these hydrocarbons was blended with the primary-reference fuel mixtures of iso-octane and normal heptane to make blends covering all possible combinations of the variables of hydrocarbons inserts, TEL concentrations, and normal research-octane levels.

Laboratory and road tests conducted by Ethyl Corp. show that an optimum high-octane motor fuel for both high and low speeds results from a highly aromatic blend using a maximum concentration of tetraethyl lead.

This optimum fuel would consist of 60% paraffin and 40% aromatic hydrocarbons, with 3 cc. of TEL per gal. The study found that aromatics will undoubtedly be a major component in most gasoline blends, due to their availability from catalytic reformers. The relative quantities of olefins and paraffins, it was found, may be subject to some variation, depending on whether excess light hydrocarbons are converted by dehydrogeneration to either alkylate or catalytic polymer.

East to Get Polyethylene Plant

A long expected polyethylene plant for the East Coast became a reality last week with an announcement by Hercules Powder Co. that it would build a plant at Parlin, N. J.

The location of the plant is in the midst of a major oil refining center and within the Baltimore-New York-Boston area which contains the country's largest concentration of users of polyethylene resin (PW—Oct.14 '55,p14). Refinery gases for making ethylene, the basic raw material for polyethylene, are readily available. While there are no ethylene plants in the area, several petroleum companies are reportedly considering such a plant. One of the largest refiners in the area is expected to announce a new ethylene plant shortly.

Hercules already is a big user of ethylene and is now negotiating for an ethylene supply. The company said this week that it would be prepared to produce its own ethylene if an outside supply is not available.

Hercules will produce a new type of high-molecular-weight, low-pressure polyethylene, using the Ziegler process. This new process for making linear polyethylenes was developed by Dr. Karl Ziegler of the Max Planck Institute, at Mulheim, Germany. The Ziegler process produces a new type of polyethylene, which is being acclaimed as a plastic material that retains many of the desired qualities of old-type polyethylene, but has greater rigidity, greater strength, more heat resistance, and less fluid permeability.

The process is somewhat similar to the process developed by Phillips Petroleum Co.'s chemical subsidiary and one that is near the development stage by the Italian firm, Montecatini.

Phillips is building a commercial polyethylene plant at its Houston chemical plant using its newly developed process. Capacity is expected to be in the neighborhood of 100-million lb. annually. Grace Chemical Co. has been licensed to use the Phillips process and one other major chemical company is expected to announce shortly that it will use the Phillips process to make polyethylene.

There is a possibility that one of these plants will be built on the East Coast. The nearest polyethylene plant to the East Coast today is Union Carbide's Charleston (W. Va.) plant.

The Ziegler process has been licensed to several U.S. firms, including Union Carbide, Koppers, Du Pont, Monsanto, and Goodrich-Gulf Chemicals, as well as Hercules. Some Ziegler polyethylene is now being made here in plants that are considered between the pilot- and commercial-plant scale. In Germany, Farbwerke Hoechst AG is completing its commercial Ziegler process plant and, early next year, will start supplying Hercules with introductory polyethylene material.

Hercules' Parlin polyethylene plant is planned for completion late in 1956. Annual capacity will be about 30-million lb. Estimated cost is $10-million.

Hercules will name its new polyethylene plastic "Hyfax." Due to the qualities of the new polyethylene, Hercules says, the plastic will have broader uses than old-type polyethylene plastics in the production of kitchenware, toys, piping, and many other household and industrial applications.

What's New / IN REFINING

Honolulu's City Planning Commission has given conditional approval to refinery building plans of Standard Oil Co. of California (PW—Oct. 7'55,p30). The conditional O.K. was given after Dr. Paul Magill, senior scientist with the Stanford Research Institute, gave assurances that the proposed $30-million refinery would bring "no odor, no effect on plant life, animals, or fish." The condition is that Magill back up his statements within 60 days by supporting evidence.

The conditional approval will enable federal government departments to proceed with legal advertisements to arrange the auction of the intended site, Sand Island, in Honolulu Harbor. Several local groups have opposed the refinery proposal and have sought to convert the U.S.-controlled island into a beach park.

•

Petro-Tex Chemical Corp. will expand output of its Houston butadiene plant by about 50% with construction of new facilities. The plant, acquired from the federal government last April, now has a capacity of 90,000 short tons a year. Bechtel Corp., of San Francisco, will begin work on the new facilities immediately and expects to complete the job by the end of 1956.

Petro-Tex also contemplates addition of a process research laboratory, pilot-plant facilities, and enlargement of plant offices as part of its planned expansion.

•

Fluor Corp. of Canada, Ltd., will build the major part of Imperial Oil Ltd.'s $4½-million wax plant at Sarnia, Ontario. Imperial announced the contract earlier this month. The plant is scheduled for completion in October, 1956. When in operation, it will have an annual capacity of 35-million lb.

•

Goodrich-Gulf Chemicals, Inc., intends to start immediate construction of a pilot rubber plant at Avon Lake, Ohio. The plant will produce man-made rubber that duplicates natural rubber, according to the company. About 35 scientists, chemists, and other personnel will be employed at the plant. Goodrich-Gulf is owned equally by B. F. Goodrich Co. and Gulf Oil Corp.

Fluor Corp., Ltd., will build a 4,000 b/d fluid coking unit for Bankline Oil Co. at its Bakersfield (Calif.) refinery. The new unit will convert topped crude and thermally cracked fuel oil to gasoline, gas oil, gas, and petroleum coke. The gas oil will be used as charge stock for Bankline's thermal cracking unit, to produce additional gasoline.

Detailed engineering has started and field construction will begin early next year. Completion is scheduled for late 1956. Bankline has obtained a license from Esso Research & Engineering Co. to use its fluid coking process.

•

Houdry Process Corp. says it will design a 750 b/d Houdriformer for Sioux Oil Co., of Newcastle, Wyo. Litwin Engineering Co., of Wichita, Kan., will build the Houdriformer, which is designed to process the naphtha cut of sweet Newcastle crude.

•

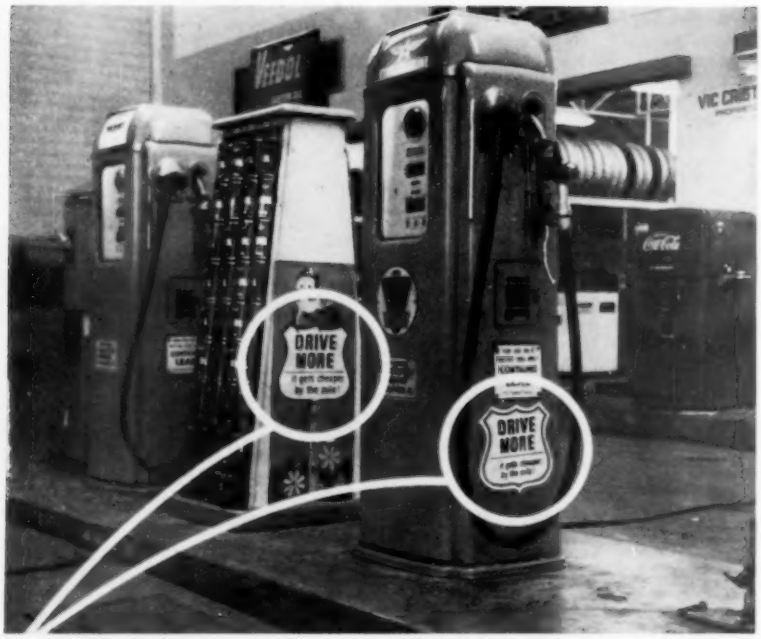
Westland Oil Co.'s bid of $150,000 for the 1,500 b/d refinery of Williston Basin Refining Co. at Williston, N. D., has been accepted and confirmed by the U.S. referee in bankruptcy.

•

Southland Oil Co. will start work immediately on a $25-million refinery at Tampa, Fla. The Dallas company has leased 500 inland acres as well as additional property to run a 2-mi. pipeline to carry crude from tankers to the refinery. The refinery will have a capacity of between 25,000 b/d and 30,000 b/d and will produce gasoline, jet fuel, kerosine, asphalt, and other products.

Petrofina's Cat Cracker Goes on Stream

THIS HOUDRIFLOW CAT CRACKER was placed on stream last week at the 20,000 b/d Montreal refinery of Canadian Petrofina, Ltd. (PW—Sep.9'55,p29). The 16,600 b/d cracking unit is presently being charged with light and heavy gas oil from the plant's vacuum distillation unit. Gas oil from the coker will be used later.



DRIVE-MORE CAMPAIGNS are one "creative" way the oil industry is aiming at . . .

Making the Market Bigger

"Creative selling"—the effort to boost over-all demand instead of battling for established business—is on the upswing in the oil industry, a PETROLEUM WEEK survey reveals.

Men like Marc F. Braeckel, marketing director of Sinclair Refining Co., have been preaching the need for such spirit. Braeckel says too many oilmen have been "scrambling" for the bird-in-hand, while the real bush-beating has been accomplished by auto, machinery, and oil-burner makers, plus other sources outside the industry.

Most oil products, he says, have been "bought," not really "sold." But the emphasis seems to be shifting.

Ethyl Corp.'s expanding "Drive More" campaign is being hailed as a long-overdue drive against those forces that tend to keep automobiles idle, and against the aggressive selling of plane, train, bus, and marine interests.

This campaign is designed to convince motorists of the convenience, comforts and pleasure possibilities of their private cars. It underscores this pitch with an American Automobile Assn. finding that driving gets "Cheaper by the Mile."

AAA says fixed depreciation, license fees, and insurance, when added to the 5,000-mi. travel costs of a man, wife, and one child, give the family an average transportation cost of 5.2¢ per mile. But spreading the fixed costs over 15,000 mi. in the same period, says the AAA, reduces the average mileage cost to 2.5¢.

Ethyl has spent an estimated $500,000 on shields, banners, posters, and other advertising materials to spread the word. Oil companies and others interested in promoting travel have been getting much of the material at printing cost, some of it free.

To date, 40 oil companies have adopted the "Drive More" program—some with an individual twist, others simply using Ethyl material. Tide Water Associated Oil Co. is the latest (picture above).

Is the drive doing any good? That's tough to answer, but invariably the participating companies polled by PETROLEUM WEEK reported enthusiasm by both dealers and company executives. One promotion manager, in fact, adds: "The Oil Industry Information Committee should take up where Ethyl has left off. They spend a lot of money during Oil Progress Week on such things as 'Oil in 1976,' when what we're interested in is selling more product in 1956."

Most of the companies participating in the campaign say they intend to step up their efforts next year. And since "Drive More" didn't get under way until May—after advertising budgets for the year were set—a lot more companies are expected to board the bandwagon when the new budgets are fixed.

Of the individual companies' own efforts to increase driving, the most attention-getting is Sinclair Refining Co.'s "Parks" program. Sinclair started last February advertising the beauties of 10 national parks, each ad praising the conservation efforts of some organization, such as the Boy Scouts, the Audubon Society, and the National Grange.

The ads' message mushroomed into national prominence. The "saluted" groups extolled the company's "public service" in their own publications, and editors and column writers all over the country complimented the promotion. Thousands of letters have been pouring into company offices, many assuring Sinclair the writers have been inspired to visit one or more of the parks.

As a result, the company is going to cover 10 more parks in its 1956 advertising, this time using color plates and extending the program to newspapers and, possibly, television.

Other companies, such as Esso Standard Oil Co., Socony Mobil Oil Co., Richfield Oil Co., and Standard Oil Co. of California, have their own approaches.

• Esso, which pioneered the road-map and tour-guide service to make motoring more attractive, has a series of films, available without charge to civic, patriotic, and religious groups. Each film depicts the beauties of a state or area in Esso's marketing territory. The films contain no "commercials"; their main purpose is to stimulate travel.

• California Standard and its affiliates feature full-color pictures, suitable for framing. The pictures are passed out to motorists by dealers; again the object is to inspire scenic auto tours.

• Richfield's emphasis is on western wild flowers. The program features free booklets, free seeds (this year the company gave away more than 750,000 packets), and radio newscasts. Next year a new film, "Wild Flowers of the West," will be added to the program.

• Socony Mobil has teamed up with the Outboard Boating Club of America to promote interest in small craft (and the travel necessary to enjoy such hobbies). This year's booklet,

"Outboard Marinas," features construction and maintenance of docking, launching, and lunching facilities. Tentatively scheduled for next year is a promotion involving both inboard and outboard motorboating.

On the industry level, the American Petroleum Industries Committee plans to push for more driving by promoting a "positive" safety program.

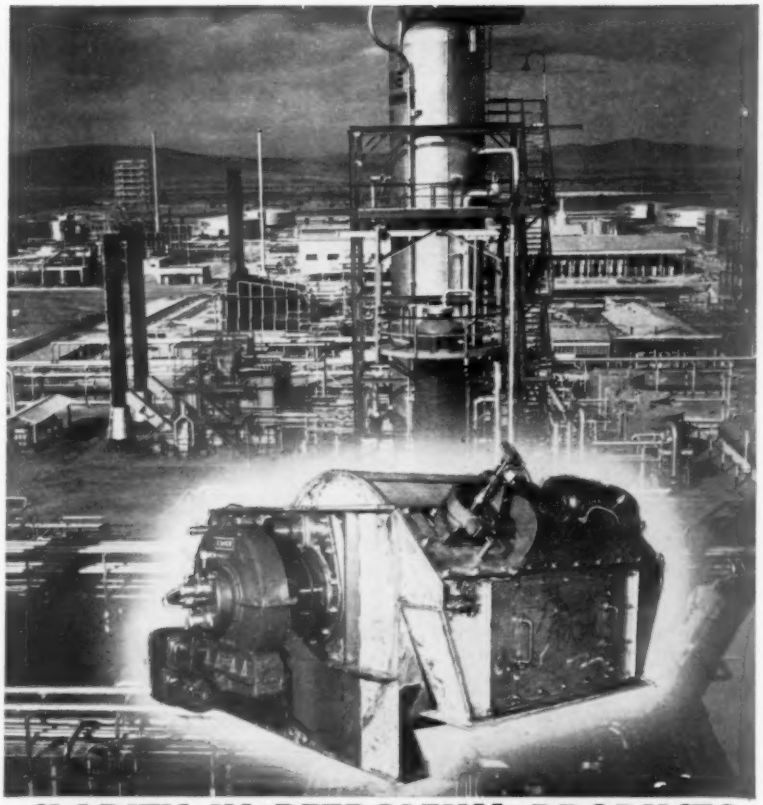
In the past, most safety drives have emphasized accidents, deaths, and other negative aspects of motoring—scaring many drivers into leaving their cars in the garage on weekends and holidays.

Starting Nov. 21, though, APIC is going to publicize a good-driving approach, stressing such words as "pride," "coordination," and other terms designed to promote more expert driving instead of more fear of the highways.

In other industry areas, increased total demand for such items as asphalt, fuel oil, and liquified petroleum gas is the goal of still more "institutional-type" programs.

- The National Council for LP-Gas Promotion spent more than $2-million in the first nine months of this year advertising the "cleaner" qualities of LPG and promoting LPG appliances and services. K. R. D. Wolfe, of Fisher Governor Co., council president, believes the campaign boosted LPG consumption by 8% or 9% over last year's.
- Oil Heating Market Reports is just getting off the ground in a new program that puts industry capital behind the efforts of local and state fuel oil groups. The service was started in May, and already 32 surveys have been made to determine the promotion possibilities in individual areas. Five campaigns have been given major-company support, so far.
- The Asphalt Institute, when its members meet Dec. 7-8 in New York City, will debate a proposal to plug asphalt's attributes in "public" media—newspapers, national magazines, TV, and radio.

The Institute has concentrated its efforts, thus far, in technical manuals and other sources of interest to engineers, architects, and highway planning groups. Success of the rival portland cement people, however, has caused many Asphalt Institute members to decide the asphalt story must be made popular, too. Not only to attract potential driveway pavers and other private buyers to an oil industry product, but to influence general thinking about the type roads and highways being built in the various states.



CLARITY IN PETROLEUM PRODUCTS THRU VACUUM FILTRATION

The machine pictured above is one of a great variety of Eimco continuous vacuum and pressure filters working in the Petroleum Processing Industry.

This particular filter is a stainless steel, open type, high submergence precoating filter. Many units of this superior Eimco design are making it easier and cheaper for refineries to maintain the necessary "perfect" clarity of product for which they have become famous.

Eimcos reduce costs of clarification because they will make it possible to process more gallons per square foot of filtering area per minute and they will lengthen the life of a precoat media.

An Eimco engineer will be glad to answer your questions about details.

EIMCO GEARED AIR MOTORS

Eimco Geared Air Motors are made in three sizes rated 7½, 12 and 18 HP at 90 psi air pressure. These motors are 5 cylinder radial type for reversible or one direction operation.

This dependable power unit provides unusual safety where explosive hazards are a consideration.

THE EIMCO CORPORATION
Salt Lake City, Utah, U.S.A.
Export Office: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas
Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-150

The Market Place

AROUND THE WORLD

Current key crude and refined oil prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service, a McGraw-Hill Publication.

All Prices as of October 17 — **Bold face type indicates changes from previous week**

KEY PRICES—REFINED PRODUCTS

(¢ per gal., except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, cargoes
- Gasoline, 97 oct prem....13-13.5
- Gasoline, 90 oct reg....11-11.5
- Kerosine....8.75-9.75
- Heating oil, No. 2....8.5-9.25
- Gas oil, 48-52 d.i....8.625-9.125
- Fuel oil, bunker "C"....$2.10-2.15

Caribbean, cargoes
- Avgas, Grade 100/130....16.75
- Gasoline, 93 oct research prem....11.5
- Gasoline, 87 oct research reg....10.5
- Gasoline, 79 oct research....9.75
- Gasoline, 70-72 oct motor method....9.5
- Kerosine....8.75
- Heating oil, No. 2....8.5
- Gas oil, 48-52 d.i....8.625
- Fuel oil, bunker "C"....$2.10

New York Harbor, barges
- Gasoline, 89 oct reg....12.25
- Kerosine....10.05-10.55
- Heating oil, No. 2....9.55-10.05
- Fuel oil, No. 6....$2.65

Okla.-Group 3, northern shpt, bulk
- Gasoline, 86 oct reg....11-11.5
- Kerosine....9.25-9.5
- Heating oil, No. 2....8-8.5
- Fuel oil, No. 6....$1.75-1.90

Chicago, bulk
- Gasoline, 86 oct reg....12
- Heating oil, No. 2....9.25-10.1
- Fuel oil, No. 6, high sulfur....7.15-7.35

Los Angeles, rack
- Gasoline, 84 oct reg....13.1-13.15
- Stove dist., PS 100....9.25-10
- Diesel fuel, PS 200....8.75-9.25
- Light fuel, PS 300....$2.05-2.10
- Heavy fuel, PS 400....$1.70-1.85

Natural Gasoline, Grade 26-70
- FOB Group 3....5.5
- FOB Breckenridge, Tex....5

Penna. Lubes
- Bright stock, 25 p.t....18.5-20
- 200 vis. neutral, 25 p.t....18.5-20

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....21-22
- Neutral, solvent, 200-210 vis....16.75-17.75

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....21-23
- Neutral, solvent, 200 vis....17.5-19.5

Eastern Hemisphere

Singapore, cargoes
- Avgas, Grade 100/130....18.375
- Gasoline, 79 oct research....10.25
- Gasoline, 70-72 oct motor method....10
- Kerosine....9.375
- Gas oil, 48 d.i. minimum....9.125
- Fuel oil, light....$3.10

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9 grav....$2.82
- North Dakota, 36.0-36.9 grav....2.82
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 grav....2.95
  - Gulf Coast, upper & lower, 26.0-26.9 grav....2.82
  - West Texas sweet, 36.0-36.9....2.82
  - West Texas-New Mexico intermediate, 36.0-36.9....2.75
- West Texas-New Mexico sour, 32.0-32.9....2.61
- East Texas, flat price....2.90
- Mirando, 28.0-28.9 grav....2.96
- **Illinois Basin, flat price....3.00**
- Penna. Grade, Bradford dist., flat price....3.60
- **California, Signal Hill, 21.0-21.9 grav....2.39†**
- North Louisiana-Arkansas, 36.0-36.9 grav....2.82
- Wyoming sweet, 36.0-36.9....2.82
- Wyoming sour, 32.0-32.9....2.48

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) D-2, D-3, L.C....2.54
- Leduc-Woodbend (Alta.) D-2, D-3....2.60
- Redwater (Alta.) D-3....2.49
- Daily-Mississippian (Man.)....2.34
- Smiley-Viking (Sask.)....2.24

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido....3.40
- San Joaquin, 41.0-41.9, Puerto la Cruz....3.04
- Oficina, 35.0-35.9, Puerto la Cruz....2.88
- Tia Juana Medium, 26.5-26.9, Amuay....2.30*
- Bachaquero, 16.5-16.9, Amuay, Las Piedras....1.90**
- West Tarra, 37.0-37.9, Cardon....2.99
- Lagunillas Heavy, flat prices: Cardon....1.90
  Amuay, Las Piedras....2.05

Differential per ½ deg. grav.: (*) 2.5¢ bbl. (**) 3.5¢ bbl.
†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabian, 36.0-36.9, Ras Tanura....1.97
- Basrah, 36.0-36.9, Fao....1.92
- Iranian, 34.0-34.9, Bandar Mashur....1.91
- Iranian, 34.0-34.9, Abadan....1.86
- Iraq, 36.0-36.9, Fao....1.92
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.72
- Qatar, 39.0-39.9, Umm Said....2.06

Middle East, E. Mediterranean
- Arabian, 36.0-36.9, Sidon....2.39
- Iraq, 36.0-36.9, Tripoli, Banias....2.39

Far East (Cargoes, FOB Lutong, Sarawak)
- Seria Light, 37-38 grav....2.60

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U. S. Gulf-New York, clean....(USMC −10%) $2.57
- U. S. Gulf-New York, dirty....(USMC −30%) $2.00
- NWI-USNH, dirty....(USMC −35%) $1.76
- NWI-UK/Continent, dirty....(MOT −7½%) 30/1*
- **Persian Gulf-UK/Cont., dirty..(Scale −2½%) 52/11***
- **Persian Gulf-USNH, dirty....(USMC −30%) $8.89**

**Sterling*

The Market Trend

Gasoline Eases Heating Oil Cares

Gasoline's position is exceptionally strong in primary supply markets this fall. It's doing much to soften tension for the refiner during his usual nail-biting period—the long, long wait for heating oil weather to arrive. Some other products also are in good shape from the standpoint of both price and demand. But motor fuels are the refiner's biggest money maker.

The contrast with this time last year is sharp. Not only is demand running around 7% higher, but prices show unusual firmness for fall. And, judged by recent reports, the forward position still looks almost as rosy as it has at any time in this year's transition from summer to winter markets.

The Gulf Coast cargo market for top-quality regular-grade is a case in point. Buyers say it's firmly pegged at the low quoted price—11¢ a gal. And some refiners are even saying that they will have none for open market sale for lifting prior to Dec. 1. A year ago, the price was an easy 10.5¢. And discounts of as much as 0.5¢ a gal. were being offered then to bait buyers.

Moving up to the interior, Group 3's current low-quoted price for regular also is 11¢. It, too, was 10.5¢ in October last year. And some refiners who have been buyers to meet contract commitments all summer are still on the buying side of the market. One, from Oklahoma, expects his Jan. 1, 1956, inventory to be only 35% of what it was last Jan. 1. He commented this week: "Gasoline looks good to me at least until spring. And then, of course, I'll have to start building inventory for next summer."

Avfuels Play Part: The tie-in of avfuels with the status of motor gasoline is becoming increasingly important. There's just so much alkylate available, whether it's used to build up to the high-octane premium motor fuels which are the order of the day, or used to make aviation gasoline. A big supplier to the military had to "scratch the market" this week to obtain 50,000 bbl. of low-octane gasoline he needed for jet-fuel blending.

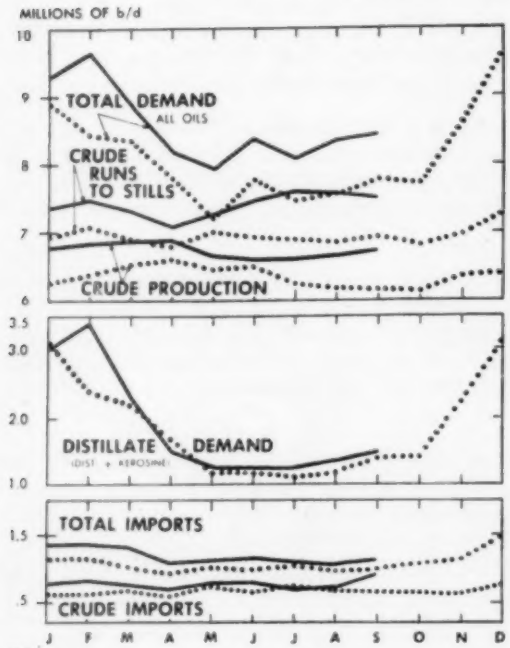
Price Wars: New Jersey's ever-recurring gasoline price war broke out again late last week, after three weeks of comparative quiet. Sun cut dealer tank wagon 1.5¢, to 13.5¢; Esso Standard and others followed. Sun said its move was to enable its dealers "to meet their competition at the retail level . . . make a profit . . . continue in business."

New Demand: There's call for American refined products from an unexpected quarter. Reports from Mexico say refining and shipping facilities suffered badly from the recent hurricanes and accompanying floods. Just what, and how much, the country needs to offset its own production losses appears to be somewhat of a secret. But a southwestern refiner reports selling 20 cars of diesel for shipment to various points south of the border.

Distillates: Two large suppliers with refineries both in the Midwest and at the Gulf took a close look at their No. 2 fuel slates recently. One saw his over-the-winter position long in the Midwest, the other short in the same area; their positions at the Gulf were the reverse. Result: Swap of approximately 600,000 bbl. of product.

PETROLEUM WEEK'S

Fingertip Figures



TOTAL DEMAND

Latest 4-week average	8.342
Year ago	7.731

RUNS TO STILLS

Latest week	7.357
Previous week	7.191
Year ago	6.765

CRUDE PRODUCTION

Latest week	6.714
Previous week	6.690
Year ago	6.196

DISTILLATE DEMAND

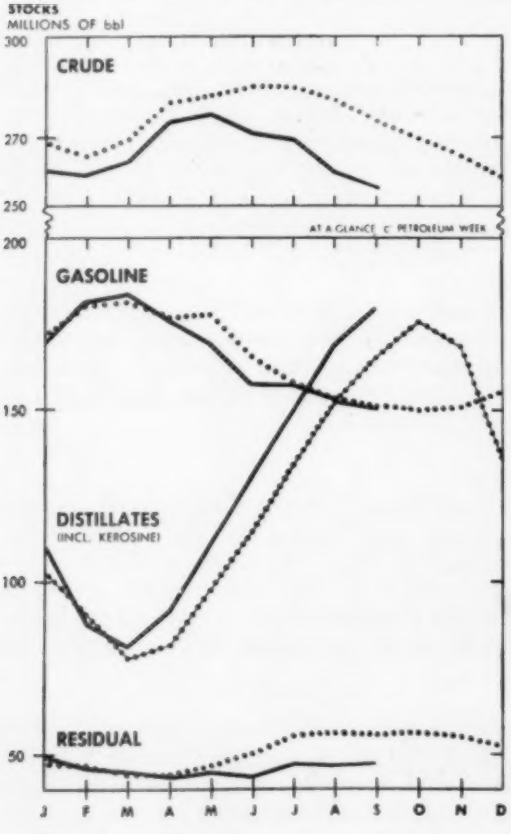
Latest 4-week average	1.448
Year ago	1.441

TOTAL IMPORTS

Latest week	1.003
Previous week	1.146
Year ago	.866

CRUDE IMPORTS

Latest week	.694
Previous week	.825
Year ago	.524



CRUDE STOCKS

Week ended 10-8	255.0
Previous week	254.8
Year ago	273.2

GASOLINE

Latest week	150.5
Previous week	151.0
Year ago	150.9

DISTILLATES

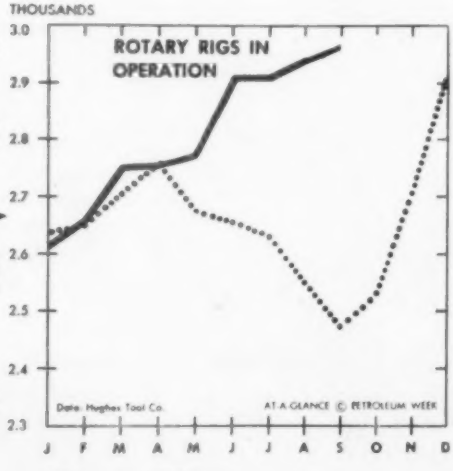
Latest week	186.1
Previous week	182.0
Year ago	171.9

ROTARY RIGS

Latest week	2.979
Previous week	2.945
Year ago	2.531

RESIDUAL

Latest week	47.3
Previous week	47.0
Year ago	56.2



DOMESTIC CRUDE oil production will have to be increased substantially during the remainder of 1955 to meet expected demand and to build up crude inventories to the so-called desired levels. Present crude stocks of 255-million bbl. are about 18-million bbl. below a year ago and about 30-million bbl. below the level that many oil economists say is needed at this time of year.

These economists estimate that, based on the present rate of demand, the year-end supply of crude in storage should be around 270-million bbl. to 275-million bbl. If such a working inventory is to be reached, fourth quarter domestic production will have to be increased about 400,000 b/d above present output.

Even if crude inventories are merely to be kept at about the present level for the rest of the year, it is estimated that domestic crude oil output will have to be increased by about 230,000 b/d.

The current crude oil stock position and the probable demand for the rest of the year were the reasons for the 74,389 b/d increase in the Texas November allowable made by the Railroad Commission Wednesday. And unless unusually mild weather occurs during the next 30 days, it is quite likely an even bigger boost in the Texas allowable will be needed for December.

"We have done a miserable public relations job in our own industry."

"The trouble is, we've been talking to each other too much."

"I'm satisfied to develop a small company, where I can look after the whole thing."

"I really don't have time to go fishing; I just take off and go."

French M. Robertson . . .

Chides Oil's Public Relations

French M. Robertson, newly elected president of the Texas Mid-Continent Oil & Gas Assn., is convinced the petroleum industry needs to do a much better job of selling itself.

Robertson was elected president of the state's oldest and largest organization of oil and gas producers at the association's 36th annual meeting. He comes well-equipped for the office, being a director of the general Mid-Continent Oil & Gas Assn., the American Petroleum Institute, and the Independent Petroleum Assn. of America.

He also is a past president of the West Central Texas Oil & Gas Assn. and a former vice-president of the Texas Independent Producers & Royalty Owners Assn., and of the Texas Manufacturers Assn. These organizations, and others to which he belongs, have made Robertson keenly aware of the selling job facing the industry.

"We have done a miserable public relations job in our own industry," says the 54-year-old native of Stonewall County, Tex. "The trouble is, we've been talking to each other too much. What we need to do is take our problems back to the people in a grass-roots campaign."

Robertson also believes there is room for much improvement in oil-industry cross-communication. "The producers have lost the support of the service station men," he explains. "These people are just as much a part of the industry as we are, and they should have a better understanding of the oil industry." He feels that people in all levels of the petroleum industry should be made aware of the industry as a whole, and of their part in making it what it is.

As a Texan who has had a lot of experience in "selling" facts to the public, Robertson seems well-qualified to present the industry's problems in a way to win popular support.

Robertson is serving his ninth year as a member of the board of the Texas Prison System, the past four as chairman. In this time he reorganized the system so successfully that he raised it from one of the nation's worst to one of the best. Overcoming the public's "inertia," as he puts it, was the toughest part of his task. But he succeeded, winning broad public support.

Civil Defense gave Robertson another big opportunity to exercise his "selling" talents. He organized, staffed, and trained personnel for the regional agency responsible for civil defense activities in Texas, Oklahoma, Louisiana, New Mexico, and Arkansas. He served four years as Southwest Regional Administrator for the Federal Civil Defense Administration.

Robertson started out in life as a lawyer, before he became an independent oil producer. But he was no stranger to the oil patch—his father, too, had been an independent oil producer.

Robertson, who was born in a dugout on a ranch about 5 mi. southeast of Aspermont, Tex., acquired his first knowledge of the oil business by working for his father, John E. The elder Robertson was a West Texas merchant and oil operator, active in such famous fields as Burkburnett, Ranger, Breckenridge, Mexico, and Luling.

Young Robertson attended Baylor University, and studied law at the universities of Texas and Oklahoma. He was admitted to the bar in 1927 and was elected county attorney of Haskell County in 1929, an office he held for two terms before returning to private practice.

During the depression, many of Robertson's clients, unable to pay cash, made payment with leases or interests in wildcat ventures in exchange for title examinations. As a result, by 1937, he was actively engaged in oil.

His first three wildcat ventures were failures. His fourth, started with a one-

PROFESSIONAL SERVICES

Petroleum Service Management Company, Inc.

Consulting Engineers and Geologists

Research, Evaluations, Bank Loan Reports, Investigations, Reports for Underwriting Issues, Well Supervision, Property Management, Contract Leasing, Drilling Deal Recommendations, Purchase of Proven Oil and Gas Properties. Complete management and supervision, U.S.A.-Foreign Refinery Design, Construction and Management. We handle all of your operations on straight retainer and management fee basis, or participating and retainer basis. 306 Commerce Building, Box 1992, Abilene, Texas. Phone 2-9621.

CLASSIFIED

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION WANTED

Service Station Supervisor, 15 years major and independent experience. Under 40, will relocate, available now. PW-7968, Petroleum Week.

PERSONNEL MANAGERS

LOOKING FOR ENGINEERS . . . TECHNICIANS ?

Write for free copy of

"RESERVOIR OF ENGINEERS AND TECHNICAL MEN"

THE engineers and technicians you want to reach are gathered in convenient, compact groups—as this 12-page booklet points out.

It keys the job titles these men hold to the McGraw-Hill publications they read for on-the-job information. It explains how you can make contact . . . channel, concentrate your employment advertising to just the men with the job qualifications you want.

Write for your free copy to
Classified Advertising Division
McGraw-Hill Publishing Co., Inc.
330 W. 42nd St., N. Y. 36, N. Y.

sixth interest and borrowed pipe, was successful. Robertson was on his way.

In 1939 Robertson built one of the first gas compressing plants in the West Central Texas area. The plant was located in the North Novice field.

World War II came along and interrupted his oil career, but not his growth. He won the Legion of Merit for his work as training director for the Air Force Command in the Warner-Robbins area.

Besides the medal, Robertson developed a love of flying which has remained with him to this day. He served 44 months and then returned to West Texas, where, in 1946, he acquired leases in several counties. His first postwar well was a producer in the Sharon Ridge field of Scurry County. Since then he has drilled over 100 wells in the field and has participated in, or drilled, more than 250 wells in the West Texas area.

Though Robertson says he is content with development and supervision of a small oil producing company, he doesn't believe in standing still. Now he has joined with three other oil operators in forming a company to explore for uranium.

He won't say exactly how much production he holds, but adds, "I like to keep it around 1,000 barrels a day, in addition to gas production and the propane and butane we produce." Most of his production is in West Texas, with 12 wells in Kentucky. His organization once had about 100 workers, but this was cut down to the present 30 when he dropped the drilling end of the business to concentrate on production.

"I'm satisfied to develop a small company, where I can look after the whole thing," he says.

Robertson and his three new partners in the uranium venture have hired a couple of geologists whom they keep in the field at all times, concentrating in the Utah area. The new company has staked a number of claims and has already done some exploratory work on them.

But it's not all work and no play for the affable, cigar-smoking Texan. Besides hunting and fishing, Robertson likes to fly often in his own plane.

"I really don't have time to go fishing; I just take off and go," Robertson says, typically. "For instance, I have gone to Old Mexico three times in the last 24 months on fishing expeditions."

He flies his plane, an Aero Commander, "everywhere, and nearly every day," he says. "I used the airplane in my Civil Defense job flying over five states, and now, of course, in the oil business."

WILLIAM M. BRODRICK will manage the exploration dept. of Anderson-Prichard Oil Co's West Texas-New Mexico division, headquarters in Midland. He is rejoining APCO after leaving in 1952 to work as an independent. He now succeeds **Roy Harris,** who has resigned to work as a consulting geologist and an independent oil operator.

ELMER H. WELLEMEYER has been elected vice-president of Cities Service Petroleum, Inc., top petroleum advisory group of the Cities Service organization.

J. HARRY WOOD, vice-president and general manager of Atlantic Pipe Line Co., Dallas, will manage an intensified program of acquiring additional oil producing properties for the firm's parent company, The Atlantic Refining Co. He has been with Atlantic for almost 40 years.

FOUR NEW VICE-PRESIDENTS have been named by the board of directors of Honolulu Gas Co. They are: **J. C. Rosebrooks,** treasurer; **Lyman L. Gowans,** executive engineer; **George Tuggle,** operations superintendent, and **Robert D. Scott,** general sales manager. The board also promoted **Restarick Withington** from assistant secretary to secretary.

HASKELL DAVIS will supervise the new Abilene branch office of King-Phillips, Inc., Fort Worth contract drilling company.

W. EDWARD LEE, general manager and principal owner of Continental Drilling Co., Ltd., San Angelo, has moved to Midland to open the company's new headquarters.

H. L. BRINSON and **CARR P. COLLINS** have formed Brinson-Collins Oil Co., with offices in Midland, after buying all outstanding stock of Dahm Oil Corp., Dallas. Both will continue their roles as principal stockholders of Milestone Drilling Co., Midland.

HORACE H. CHANDLER, assistant superintendent at The Texas Co.'s Eagle Point Works, at Westville,

N.J., since 1954, has been advanced to superintendent. He succeeds **R. H. Aitken,** named manager of the refining division of Texaco's foreign operations department. **W. R. Sorenson,** assistant supervisor of the process division, New York, will replace Chandler as assistant at the Eagle Point Works.

R. S. DOUGLASS has been named superintendent of Shell Oil Co.'s refinery at Norco, La. He replaces **L. T. Wilson,** recently named manager of Shell Oil Co. of Canada's Montreal refinery. Douglass has been assistant manager of Shell's manufacturing engineering department, New York.

HOWARD E. HUGHES has been promoted to superintendent of Shell Chemical Corp.'s Houston plant. He has been assistant superintendent, technical department. He replaces **Frank G. Watson,** recently named assistant to the vice-president in charge of manufacturing. Hughes joined Shell in 1934.

C. W. SCHROEDER has been elevated from chemist to research supervisor at Shell Development Co.'s Emeryville (Calif.) research center.

EGER V. MURPHREE, president of Esso Research & Engineering Co., has received an honorary degree of Doctor of Engineering from Brooklyn Polytechnic Institute. Cited among reasons for the award is his development of the "Murphree efficiency scale," now the standard measure of distillation processes.

JOHN G. RICHARDS, former reserves and valuation engineer for The Texas Co., has joined the oil loan division of the Fort Worth National Bank as a petroleum engineer. He joined Texaco in 1946, resigned last week.

WILLIAM B. BORST will coordinate construction and refining for Ashland Oil & Refining Co. He was transferred last month to company headquarters at Ashland, Ky., after serving for eight years as superintendent of the company's Canton (Ohio) refinery. His new duties were announced last week.

B. BYNUM TURNER has been elected executive vice-president of Ethyl Corp. The post is new. He has been vice-president in charge of research and engineering since 1951. Meanwhile, **Dr. Lawrence R. Hafstad,** an atomic energy scientist, has joined the firm as a director. He is a vice-president of General Motors Corp. He replaces **Charles L. McCuen,** who retired this year as an Ethyl director, as vice-president of General Motors, and as general manager of The Research Laboratories Division.

EUGENE E. DAWSON has been appointed services superintendent at Talara, Peru, for International Petroleum Co., Ltd. He headed the drilling department there. Replacing him in the latter post is **G. V. Young,** former assistant. Young, in turn, is succeeded by **S. D. Denney, Jr.,** former head of the drilling engineering section at Talara, **G. M. Stedwill,** chief chemist at the site, has been promoted to head of the refinery department. He succeeds **W. A. Reaman,** who has been transferred to company headquarters at Coral Gables, Fla., to become assistant manufacturing adviser. **John Kingston,** formerly in process operations at Esso Standard Oil Co.'s Everett (Mass.) refinery, has joined International at Cartagena, Colombia, where he will be process superintendent of a new refinery now under construction.

MILBURN J. O'NEAL, JR., group leader in Shell Oil Co.'s manufacturing-research laboratory in Houston, will receive Precision Scientific Co.'s $1,000 award in petroleum chemistry this coming April.

JOHN L. CREIGH has been named assistant manager of Delta Gulf Drilling Co.'s producing divisions, Odessa, Tex. He was production superintendent for Reynolds Mining Corp., Durango, Colo., before accepting the new post.

THOMAS BARON has been named assistant head of the chemical engineering department of Shell Development Co.'s Emeryville (Calif.) research center. He joined the company in 1951.

ADVERTISERS IN THIS ISSUE

This index is published as a convenience to the readers. Every care is taken to make it accurate, but PETROLEUM WEEK *assumes no responsibility for errors or omissions.*

Ajax Iron Works ..... 3rd Cover
Bakelite Co., Div. Union Carbide & Carbon Corp. 4
Dowell Inc. 8
Eimco Corp., The 33
Goodyear Tire & Rubber Co. 1
Kellogg Co., The M. W. ..... 4th Cover
Linde Air Products Co., Div. Union Carbide & Carbon Corp. 2
Republic National Bank of Dallas 3
Sun Shipbuilding & Dry Dock Co. 17
United States Steel Corp. 7
White Motor Co., The ..... 2nd Cover

CLASSIFIED ADVERTISING
F. J. Eberle, Ass't Mgr.
EMPLOYMENT OPPORTUNITIES 38

PETROLEUM WEEK REPRESENTATIVES

Atlanta 3
Stokes T. Henry
801 Rhodes-Harvey Bldg.
Walnut 5778

Boston 16
Edward A. Callahan, Jr.
350 Park Square Bldg.
Hubbard 2-7160

Chicago 11
G. L. Hackley, Jr.
W. F. Holbrook
520 North Michigan Avenue
Mohawk 4-5800

Cleveland 15
J. E. MacArthur
1510 Hanna Bldg.
Superior 1-7000

Houston 25
David G. Sawyer
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17
Knox Bourne
1111 Wilshire Blvd.
Madison 6-4323

New York 36
Edward A. Callahan, Jr.
Donald R. Thompson
330 West 42 Street
Longacre 4-3000

Philadelphia 3
W. A. Potter
Architects Building
Rittenhouse 6-0670

San Francisco 4
T. Evans Wyckoff
68 Post treet
Douglas 2-4600

Tulsa 19
J. A. Hartley
Room 309, 611 South Boston
Gibson 7-7767

Operations Research: A Team Job

ALL OF US will be hearing a lot more about operations research (O.R.) from now on. Some of the major companies are well into advanced studies along this line. They have taken up O.R. because business is getting more complex each year. There is a growing need for clearer goals, more objectivity, and fewer guesses. Top executives need all the information they can get to help them make sound decisions. And that's what O.R. gives them.

HOW MUCH MONEY should a company spend on drilling? A question like that leads management into a study of crude requirements, drilling costs, storage capacity, pipeline and tanker rates, refinery runs and yield, market demand for products, the weather, and dozens of other factors—all of which are variables. O.R., in a short time, can come up with an optimum drilling program that would take months or years to figure out with paper and pencil.

O.R. uses big electronic computers. It has a staff trained in mathematics, statistics, industrial engineering methods, the theories of probability and games, and a lot more.

Eventually, O.R. will have a lot to say about capital expenditures, advertising, pricing, and all the important strategy moves. It will be able to take on the whole vast problem of coordinating company policies.

And the cost of O.R. won't be a factor. Competition will make it too expensive for a company to bypass O.R. Even the smaller companies will be drawn in.

BUT OPERATIONS RESEARCH, and industry efficiency, will have slower growth if the new system is crammed down men's throats. And one of the real dangers is the feeling of some executives that O.R. competes with top management. They don't like the idea of trusting a machine's judgment.

This point got a lot of attention at the recent meeting of the Operations Research Society of America. One view at the meeting was that O.R. should provide all the facts needed to clarify a problem—but never cross into decision territory. Opposing this was the view that you can't work out a problem successfully without reaching a clear recommendation for action, which often amounts to the decision itself.

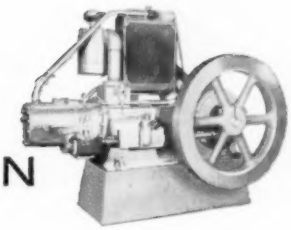
But this conflict ignores a key point: To be successful, O.R. must be an integral part of company operations. It will not be really useful as an occasional, fringe activity, directed by men outside the operating line. If top executives aren't going to rely heavily on O.R. data, they can save money by not setting up a program.

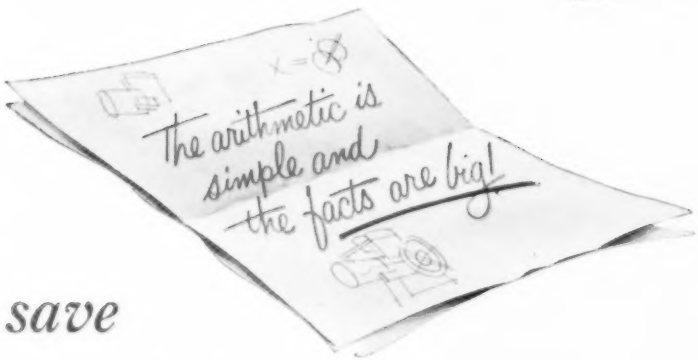
With an integrated program, top executives can't possibly be on the outside looking in. They will have to define the problem and evaluate the assumptions made in working out the answer. They will have to weigh all the intangibles, such as human relations and ethics. And they will be the ones to answer to the stockholders.

As a vital part of the O.R. program, the top executives won't need to get into operating details any more than they do in their present work. But they'll have to call the shots.

It comes down to this: Operations research and top management can go a long way—but only if they go together.

Mr. MANAGEMENT MAN





You can save half the cost of the engine each year with Ajax and Gas

Well pumping costs depend largely upon the *power* you use.

It makes no difference to a pumping unit whether gas or electricity is turning the crank—but it can make a powerful difference to you: for instance, *thousands of dollars worth of difference per well* in every five-year period.

Use electricity, and you *pay extra*. Use natural gas with an AJAX engine and you *save* money every day, month and year. These are facts—hard, simple, inescapable.

Do you want to get back the cost of a fine AJAX Engine in the first two years of operation—considering every factor of initial investment, supply lines, service, maintenance, and materials—and go on reaping an annual harvest of savings in years to come? See your Supply Man! And meanwhile, if you like cold facts, send us the electric power figures for the well with the best cost record in your operation (10 to 100 H.P.). We'll be happy to line up an AJAX-and-gas comparison, promptly.

Builders of GAS AND AJAX OIL ENGINES, PRESSURE PUMPS, STEAM DRILLING ENGINES, INDUSTRIAL STEAM ENGINES

AJAX IRON WORKS

CORRY, PENNSYLVANIA

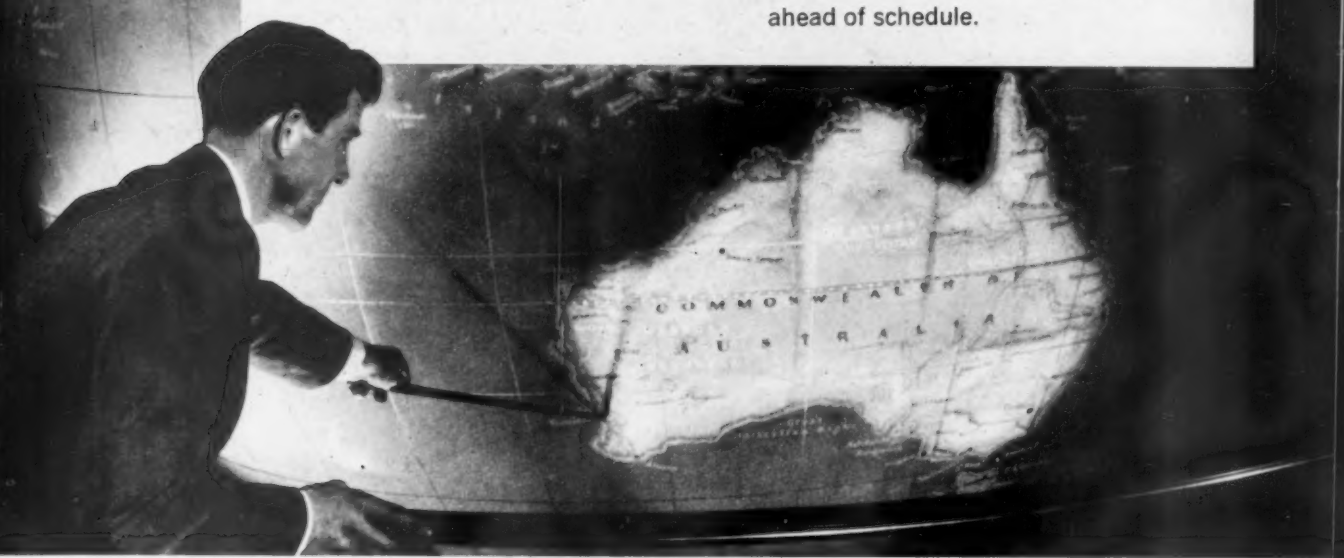
Oil Field Distributors: THE NATIONAL SUPPLY CO., PITTSBURGH, PA.; R. B. MOORE SUPPLY CO., BOLIVAR, N. Y. • BETHLEHEM SUPPLY CO., TULSA, OKLAHOMA

Petroleum Charts a Continent's Course

A plentiful supply of petroleum products is vital to a nation's industrial and agricultural growth and to its national security. In Australia, a major step toward self-sufficiency in refining capacity is The British Petroleum Company's new refinery at Kwinana. Planned now to meet almost half of the continent's 45,000,000 barrel annual goal, Kwinana is already helping attract new capital and labor to Western Australia, and promises to have a marked effect on the continent's over-all economy.

The largest and most modern refinery in Australia, Kwinana—like many other important refineries throughout the free world, was designed and built by The M. W. Kellogg Company and its subsidiaries—even to the extent of off-site installations including roads, docks, and loading, storage and housing facilities.

Due credit goes to the British and Australian sub-contractors as well as to the thousands of construction workers and engineers in Australia and abroad that this vast project was completed well ahead of schedule.



M.W. Kellogg

ENGINEERING FOR TOMORROW

Refinery Process Division, The M. W. Kellogg Company, 225 Broadway, New York 7. N. Y.

The Canadian Kellogg Company, Limited, Toronto — Kellogg International Corporation, London, Eng.

SUBSIDIARIES OF PULLMAN INCORPORATED